ISSUE 204 MAY 2011

Better Homes and Gardens®

WOOD®

The World's Leading Woodworking Resource

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Easy Weekend Project!

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Display until May 5, 2011
05
$7.95
0 92567 14072 5

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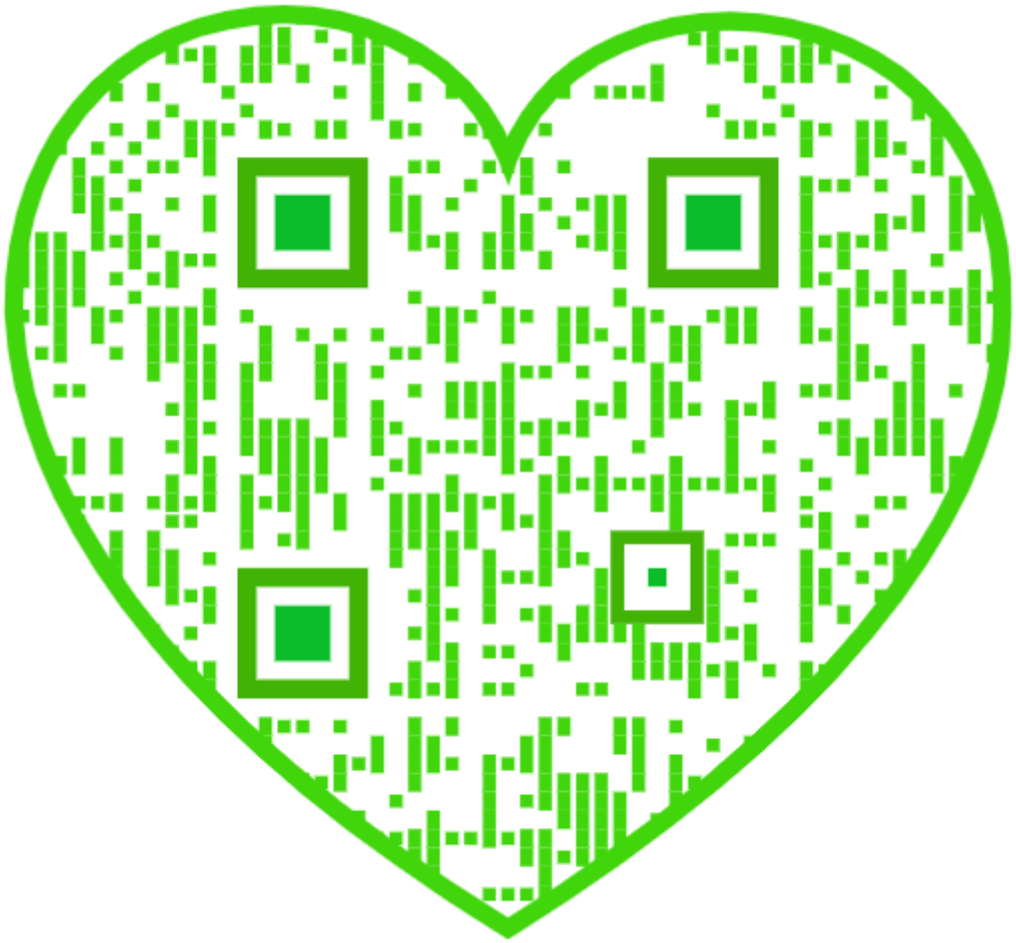

Grizzly® Industrial

Purveyors of Fine Machinery®, Since 1983

10" HYBRID TABLE SAW

BEAUTIFUL WHITE COLOR!

New!

- Motor: 2 HP, 110V/220V, single-phase
- Precision ground cast iron table with wings measures: 27" x 40"
- Arbor: 5/8" • Arbor speed: 3850 RPM
- Capacity: 3 1/8" @ 90°, 2 3/16" @ 45°
- Rip capacity: 30" R, 12" L
- Quick change riving knife
- Cast iron trunnions
- Approx. shipping weight: 354 lbs.

INCLUDES BOTH REGULAR & DADO BLADE INSERTS

G0715P INTRODUCTORY PRICE **$765.00** $89 shipping ANYWHERE IN LOWER 48 STATES

17" HEAVY-DUTY BANDSAW

BEAUTIFUL WHITE COLOR!

New!

- Motor: 2 HP, 110V/220V, single-phase, TEFC
- Precision ground cast iron table size: 17" sq.
- Table tilt: 10° L, 45° R
- Cutting capacity/throat: 16 1/4"
- Max. cutting height: 12 1/8"
- Blade size: 131 1/2" L (1/8" - 1" W)
- Blade speeds: 1700 & 3500 FPM
- Quick release blade tension lever
- Approx. shipping weight: 342 lbs.

Product Reviews & Awards ONLINE grizzly.com

INCLUDES DELUXE EXTRUDED ALUMINUM FENCE, MITER GAUGE & 1/2" BLADE

$89 shipping ANYWHERE IN LOWER 48 STATES

G0513P INTRODUCTORY PRICE **$795.00**

ALSO AVAILABLE

G0513 H-D 17" BANDSAW ~~$850.00~~ **ONLY $795.00**

10" LEFT-TILTING CONTRACTOR-STYLE TABLE SAW *with Riving Knife*

- Motor: 1 3/4 HP, 110V/220V, single-phase
- Precision ground cast iron table w/wings
- Table size: 27" x 44" • Arbor: 5/8"
- Arbor speed: 4200 RPM
- Capacity: 3 1/8" @ 90°, 2 1/4" @ 45°
- Rip capacity: 36" R, 12" L
- Approx. shipping weight: 342 lbs.

FREE 10" CARBIDE-TIPPED BLADE

New!

CAST IRON TRUNNIONS & CAST IRON MITER GAUGE

MADE IN ISO 9001 FACTORY!

G0713 INTRODUCTORY PRICE **$850.00** $89 shipping ANYWHERE IN LOWER 48 STATES

10" LEFT-TILTING TABLE SAWS *with Riving Knife & Cast Iron Router Table*

- Motor: 3 HP or 5 HP, 220V, single-phase
- Precision ground cast iron table size with wings: 27" x 48"
- Arbor: 5/8"
- Cutting capacity: 25 5/8" R, 8" L
- Max. depth of cut: 3" @ 90°, 2 1/8" @ 45°
- Approx. shipping weight: 546 lbs.

FREE 10" CARBIDE-TIPPED BLADE

$139 shipping ANYWHERE IN LOWER 48 STATES

G1023RLW *3 HP* **ONLY $1175.00**

G1023RLWX *5 HP* **ONLY $1295.00**

10" CABINET TABLE SAW *with Riving Knife & Extension Rails*

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table
- Table size with extension: 27" x 74 3/4"
- Arbor: 5/8" • Arbor speed: 4300 RPM
- Max. depth of cut: 3 1/8" @ 90°, 2 3/16" @ 45°
- Max. rip capacity: 50"
- Max. dado width: 13/16"
- Approx. shipping weight: 572 lbs.

Wood Magazine TOP VALUE APPROVED 2009

3 HP LEESON® MOTOR!

G0691

ONLY $1350.00

FREE 10" CARBIDE-TIPPED BLADE

$139 shipping ANYWHERE IN LOWER 48 STATES

MADE IN ISO 9001 FACTORY!

14" BANDSAW

- Motor: 3/4 HP, 110V/220V, single-phase, TEFC
- Precision ground cast iron table size: 14" sq.
- Table tilt: 15° L, 45° R
- Cutting capacity/throat: 13 1/2"
  - Max. cutting height: 6"
  - Blade size: 92 1/2" - 93 1/2" L (1/8" - 3/4" W)
- Blade speed: 3000 FPM
- Cast iron frame
- Steel open frame stand
- Approx. shipping weight: 165 lbs.

CAN BE PLUGGED INTO ANY STANDARD HOUSEHOLD OUTLET

G0580

ONLY $395.00 $69 shipping ANYWHERE IN LOWER 48 STATES

ULTIMATE 14" BANDSAW

New!

- Motor: 1 HP, 110V/220V, single-phase, TEFC
- Precision ground cast iron table size: 14" sq.
- Table tilt: 10° L, 45° R
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 6"
- Blade size: 92 1/2" - 93 1/2" L (1/8" - 3/4" W)
- Blade speeds: 1500 & 3200 FPM
- Approx. shipping weight: 196 lbs.

MADE IN ISO 9001 FACTORY!

Product Reviews & Awards ONLINE grizzly.com

G0555P

INTRODUCTORY PRICE **$425.00**

$69 shipping ANYWHERE IN LOWER 48 STATES

19" HEAVY-DUTY EXTREME SERIES BANDSAW

EXTREME SERIES

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision-ground cast iron table size: 26 3/4" x 19"
- Table tilt: 5° L, 45° R
- Cutting capacity/throat: 18 1/4"
- Max. cutting height: 12"
- Blade size: 143" L (1/8" - 1 1/4" W)
- Blade speeds: 1700 & 3500 FPM
- Approx. shipping weight: 460 lbs.

MADE IN ISO 9001 FACTORY!

DELUXE RE-SAW FENCE INCLUDED

G0514X ONLY $1250.00 $89 shipping ANYWHERE IN LOWER 48 STATES

13364

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12" JOINTER/PLANER COMBINATION MACHINE

BEAUTIFUL WHITE COLOR!

New!

- Motor: 5 HP, 220V, single-phase
- Jointer table size: 14" x 59½"
- Cutterhead dia.: 3⅛"
- Cutterhead speed: 5034 RPM
- Max. jointer depth of cut: ⅛"
- Max. width of cut: 12"
- Planer feed rate: 22 FPM
- Max. planer depth of cut: ⅛"
- Max. planer cutting height: 8"
- Planer table size: 12¼" x 23⅛"
- Approx. shipping weight: 734 lbs.

NEW END-MOUNTED FENCE

CARBIDE INSERT SPIRAL CUTTERHEAD!

WOOD HOT NEW TOOLS 2009

WOOD MAGAZINE TOP VALUE APPROVED 2009

FREE SAFETY PUSH BLOCKS

$139 Shipping ANYWHERE IN LOWER 48 STATES

G0634XP INTRODUCTORY PRICE **$2195.00**

ALSO AVAILABLE

G0633 JOINTER/PLANER $1995.00 **ONLY $1795.00**

G0634Z SPIRAL CUTTERHEAD MODEL $2495.00 **ONLY $2295.00**

CYCLONE DUST COLLECTOR

BEAUTIFUL WHITE COLOR!

- Motor: 1½ HP, 110/220V, single-phase, TEFC, 3450 RPM
- Air suction capacity: 775 CFM
- Static pressure at rated CFM: 1.08"
- Intake port: 6" with included 5" optional port
- Impeller: 13½"
- Height: 68½"
- Built-in remote control switch
- Approx. shipping weight: 210 lbs.

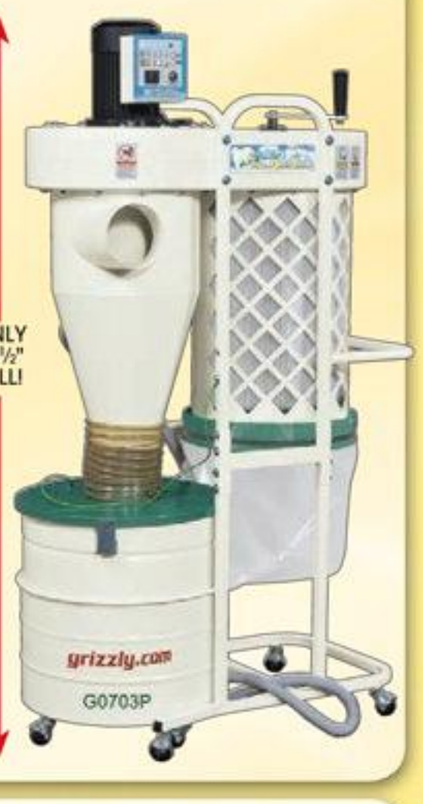
New!

PLEATED FILTER IS PROTECTED BY A STEEL CAGE

FULLY MOBILE WITH BUILT-IN CASTERS

$69 Shipping ANYWHERE IN LOWER 48 STATES

ONLY 68½" TALL!



G0703P INTRODUCTORY PRICE **$695.00**

8" JOINTERS

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision ground cast iron table size: 9" x 72½"
- Max. depth of cut: ⅛"
- Max. rabbeting depth: ½"
- Cutterhead dia.: 3"
- Cutterhead speed: 5000 RPM
- Cuts per minute: 20,000
- Approx. shipping weight: 500 lbs.

New!

FREE SAFETY PUSH BLOCKS

BUILT-IN MOBILE BASE

CHOOSE EITHER 4 HSS KNIVES OR SPIRAL CUTTERHEAD MODEL

G0656P INTRODUCTORY PRICE **$775.00**

$139 Shipping ANYWHERE IN LOWER 48 STATES

WITH SPIRAL CUTTERHEAD

G0656PX INTRODUCTORY PRICE **$1075.00**

12" x 60" SHORT BED JOINTER *with Spiral Cutterhead*

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision ground cast iron table size: 13" x 60"
- Fence: 5⅜" x 31¼"
- Cutterhead dia.: 3¾"
- Cutterhead speed: 4,950 RPM
- Bevel jointing: 45°, 90°, 135°
- Max. depth of cut: ⅜"
- Approx. shipping weight: 832 lbs.

MADE IN ISO 9001 FACTORY!

FREE SAFETY PUSH BLOCKS

PARALLELOGRAM TABLE ADJUSTMENT

G0706 ONLY $2195.00

$169 Shipping ANYWHERE IN LOWER 48 STATES

15" PLANERS

New!

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table size: 15" x 20"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: ⅛"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 660 lbs.

BUILT-IN MOBILE BASE

CHOOSE EITHER 3 KNIFE OR SPIRAL CUTTERHEAD MODEL

G0453P INTRODUCTORY PRICE **$995.00**

$139 Shipping ANYWHERE IN LOWER 48 STATES

WITH SPIRAL CUTTERHEAD

G0453PX INTRODUCTORY PRICE **$1475.00**

10" DRUM SANDER

New!

- Motor: 1½ HP, 110V, single-phase
- Conveyor motor: 1/10 HP
- Drum speed: 2300 FPM
- Drum size: 5⅛" x 10"
- Max. sanding width: 10"
- Max. workpiece height: 2 15/16"
- Min. workpiece height: 3/16"
- Variable feed speeds: 1-10 FPM
- 4" dust port
- Approx. shipping weight: 220 lbs.

WHEELS & STOWABLE TRANSPORT HANDLES FOR MOBILITY

REMOVABLE HEADSTOCK SUPPORT BRACKET ALLOWS SANDING UP TO 20"

G0716 INTRODUCTORY PRICE **$345.00**

$69 Shipping ANYWHERE IN LOWER 48 STATES

15" DISC SANDER *with Stand*

New!

- Motor: 1½ HP, 220V, single-phase, 1720 RPM
- Cast iron sanding disc size: 15"
- Cast iron table size: 12" x 20"
- Table tilt: 0 - 45°
- Floor to table height: 37⅝"
- Dust port: 2½"
- Approx. shipping weight: 232 lbs.

INCLUDES MITER GAUGE

MADE IN TAIWAN

FEATURES BUILT-IN MOTOR BRAKE & STORAGE CABINET WITH SHELF

G0719 INTRODUCTORY PRICE **$795.00**

$69 Shipping ANYWHERE IN LOWER 48 STATES

1 HP WALL MOUNT DUST COLLECTOR

- Motor: 1 HP, 110V/220V,single-phase
- Amps: 14/7
- Intake size: 4"
- Bag size (dia. x depth): 13½" x 24"
- Balanced steel, radial fin impeller
- Air suction cpacity: 450 CFM
- Max. static pressure: 7.2"
- Approx. shipping weight: 51 lbs.

SPECIAL WALL MOUNT DESIGN!

New!

EASY MOUNTING WALL BRACKET & LOCKING THUMB SCREW SECURES DUST COLLECTOR IN PLACE!

G0710
ONLY $169.95

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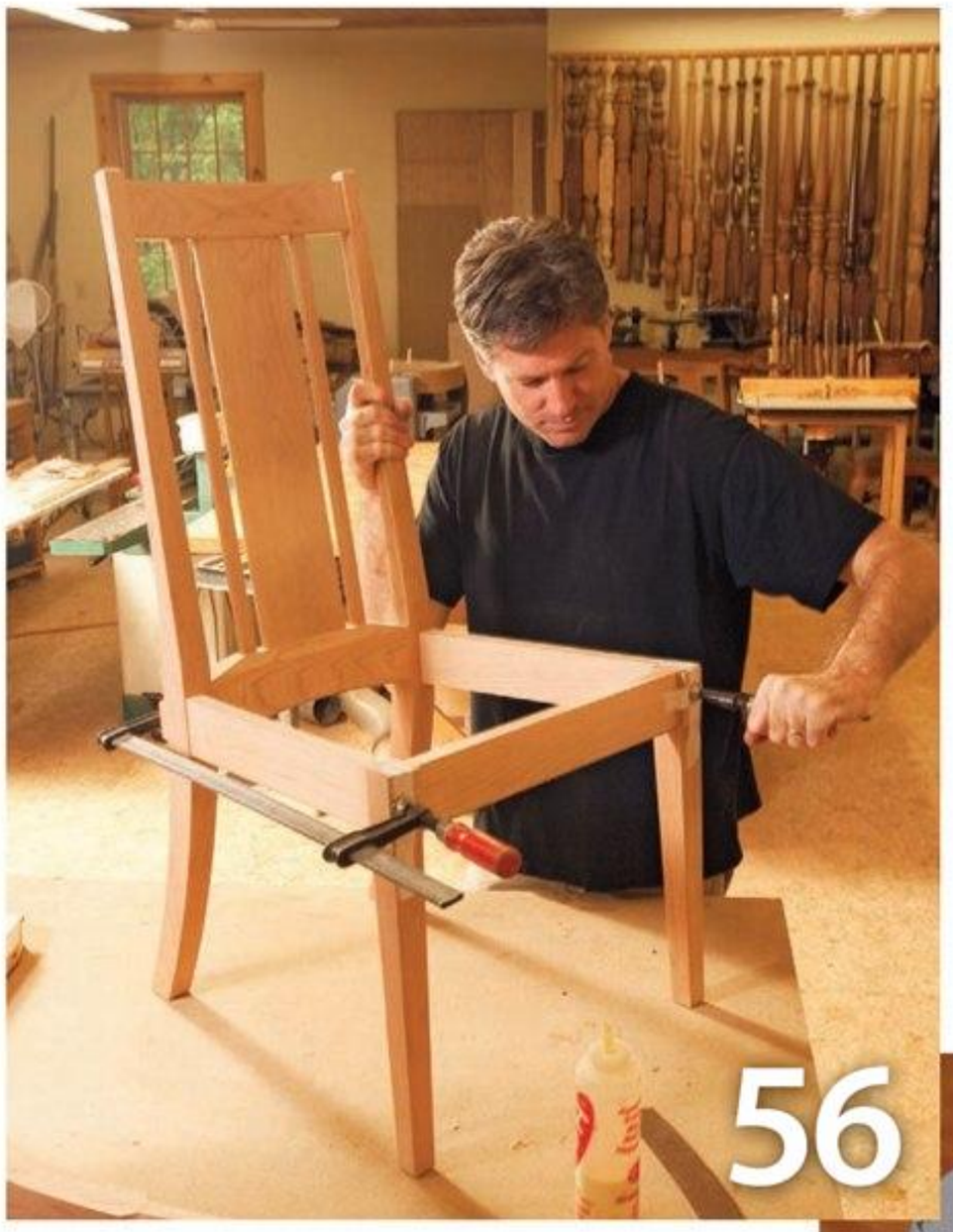

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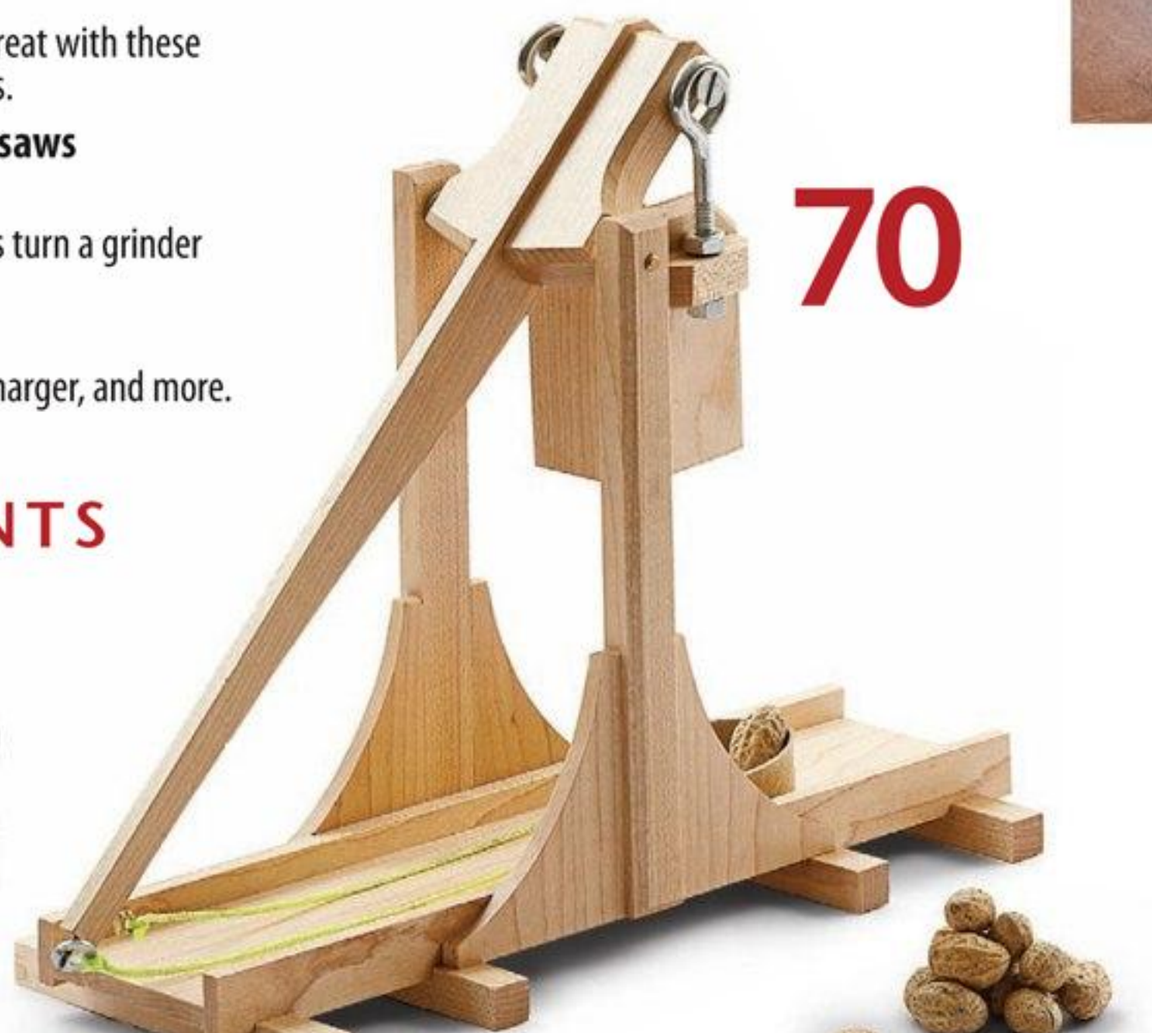

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DEPARTMENTS

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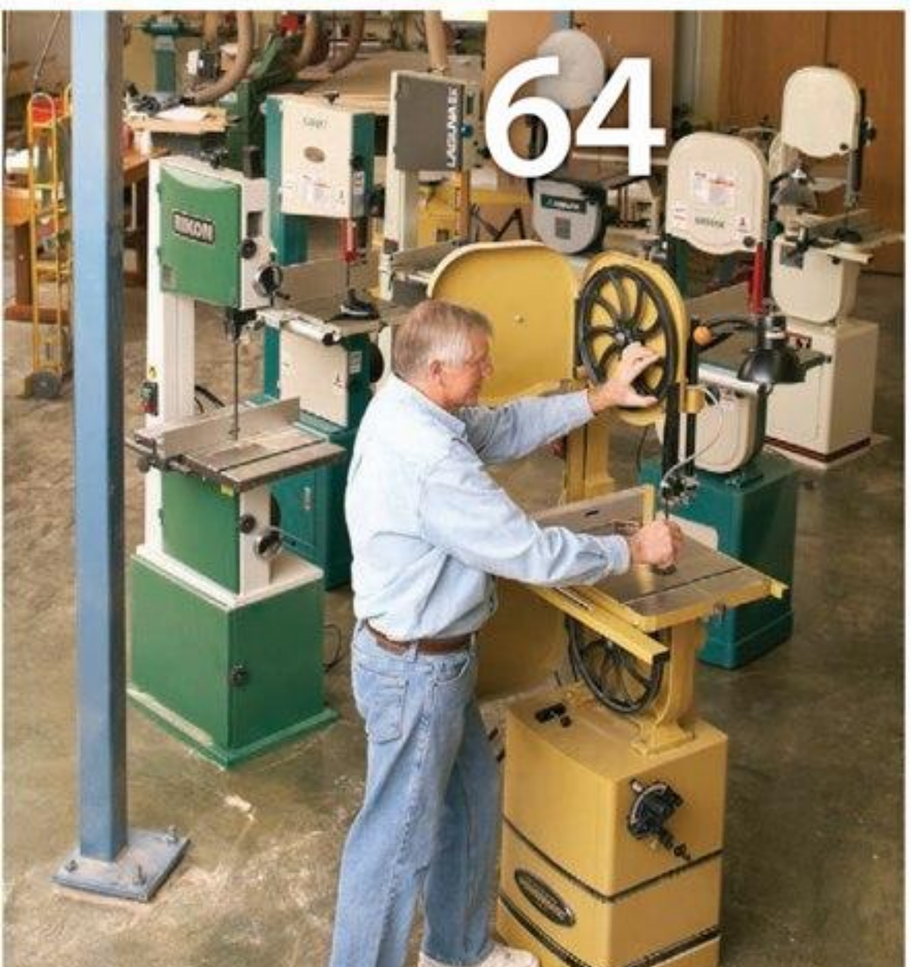
This seal is your assurance that we build every project, verify every fact, and test every reviewed tool in our workshop to guarantee your success and complete satisfaction.

WOOD MAGAZINE SHOP TESTED APPROVED®



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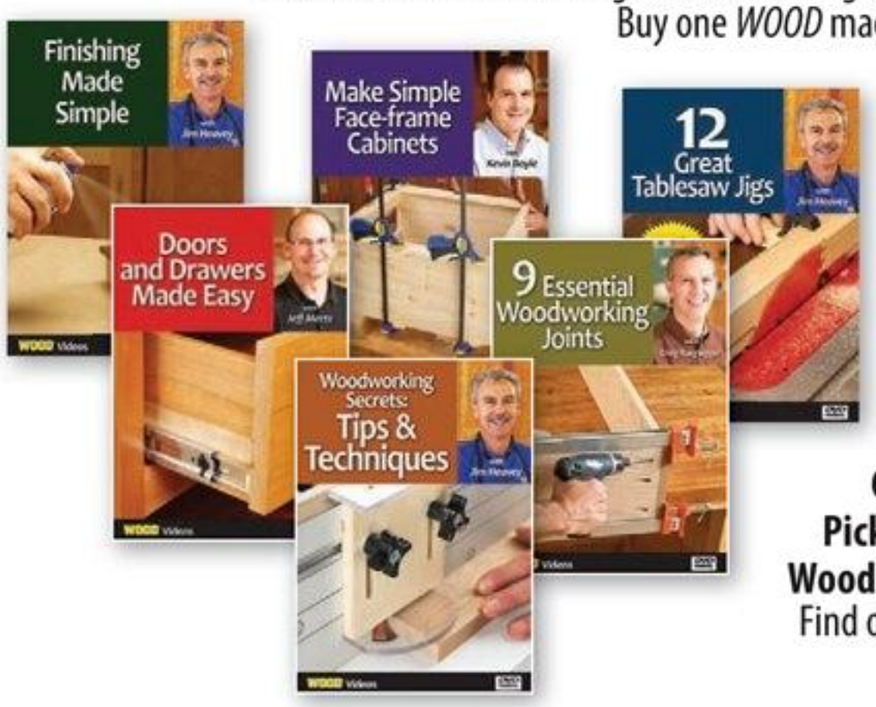
Finishing Made Simple
Make Simple Face-frame Cabinets
12 Great Tablesaw Jigs
Doors and Drawers Made Easy
9 Essential Woodworking Joints
Woodworking Secrets: Tips & Techniques

12 Great Tablesaw Jigs
Finishing Made Simple
Guide to Perfect Glue-Ups
Doors and Drawers Made Easy
9 Essential Woodworking Joints
Intro to Woodworking Machines
Make Simple Face-Frame Cabinets
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WHICH WOOD SHOULD YOU USE?

Break out of the oak-and-pine rut and choose a different—maybe even exotic—wood for your next project. At woodmagazine.com/woodprofiles, learn about more than 100 wood species from ailanthus to zebrawood and everything in between.

INNOVATIVE PRODUCTS SINCE 1989!

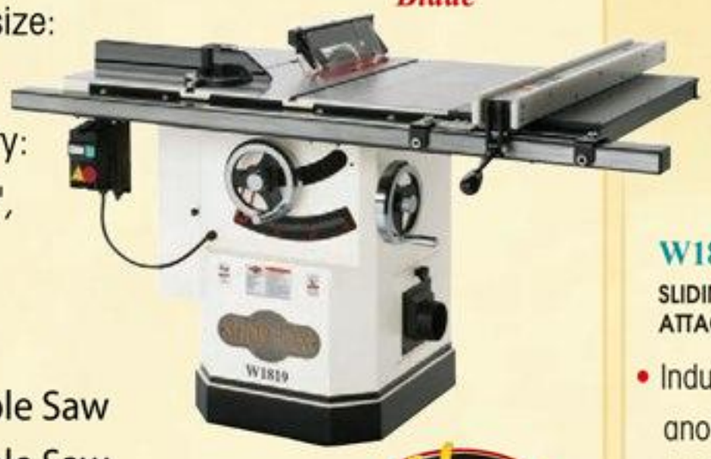
2 YEAR WARRANTY

SHOP FOX® machines are backed by a 2 Year Warranty!

10" TABLE SAWS with Riving Knife

Free 10" Carbide-Tipped Blade

- 3 HP, 220V, single-phase motor
- Cast iron table size: 27" x 40¼"
- Max. rip capacity: (W1819) 29½", (W1820) 50"



W1819 10" Table Saw

W1820 10" Table Saw w/Long Ext. Table

New

SLIDING TABLE and ROUTER TABLE ATTACHMENTS for W1819 & W1820

SAW NOT INCLUDED

New

W1821 SLIDING TABLE ATTACHMENT

- Industrial grade anodized aluminum table size: 47" x 9"
- Max. cross cut: 48"

W1822 ROUTER TABLE ATTACHMENT

- Precision ground cast iron table size: 27" x 20"
- Universal router mount

3 HP LOW PROFILE CYCLONE DUST COLLECTOR

New

- Motor: 3 HP, 220V, single-phase, TEFC class "F", 3450 RPM
- Air suction capacity: 1489 CFM
- Filter: 0.2-2 microns
- 55 gal. steel collection drum with casters

Only 80" Tall!

W1816 Cyclone Dust Collector

VARIABLE SPEED PLANER/MOULDER with Stand

New

- Motor: 2 HP, 220V, single-phase
- Precision ground cast iron table with wings: 36¼"L x 10"W
- Max. cutting width: 7"
- Max. planing height: 7½"
- Max. moulding depth: ¾"

We also carry an extensive selection of moulding knives for this machine!

W1812 Planer/Moulder

10" SLIDING TABLE SAW

New

- 5 HP, 220V, single-phase motor
- Precision ground cast iron table measures 47" x 40" with extension
- Sliding table measures 63" x 12¼"

BLADES NOT INCLUDED

Scoring blade eliminates cross grain tearout!

W1811 10" Sliding Table Saw

8" JOINTER with Parallelogram Adjustable Beds

- 3 HP, 220V, single-phase, TEFC motor
- Precision ground cast iron parallelogram design table measures 8" x 76⅝"
- Cutterheads: (W1741) 4 HSS knives (W1741S) spiral

Built-in Mobile Base

W1741 8" Jointer

W1741S with Spiral Cutterhead

OUTSTANDING SHOP FOX® ACCESSORIES

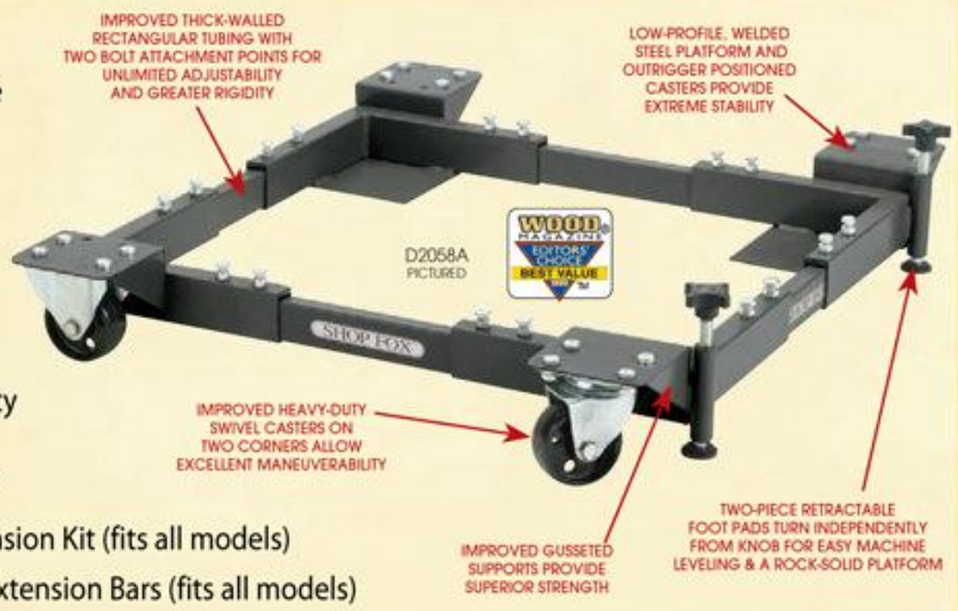
ADJUSTABLE MOBILE BASES

STRONGER FRAME WITH IMPROVED WHEELS AND GUSSETED SUPPORTS!

D2260A Mini Mobile Base 600 lb. capacity

D2057A Heavy-Duty Mobile Base 700 lb. capacity

D2058A Super Heavy-Duty Mobile Base 1300 lb. capacity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LOW-PROFILE, WELDED STEEL PLATFORM AND OUTRIGGER POSITIONED CASTERS PROVIDE EXTREME STABILITY
D2058A PICTURED
IMPROVED HEAVY-DUTY SWIVEL CASTERS ON TWO CORNERS ALLOW EXCELLENT MANEUVERABILITY
IMPROVED GUSSETED SUPPORTS PROVIDE SUPERIOR STRENGTH
TWO-PIECE RETRACTABLE FOOT PADS TURN INDEPENDENTLY FROM KNOB FOR EASY MACHINE LEVELING & A ROCK-SOLID PLATFORM

D2259A Extension Kit (fits all models)

D2246A 36" Extension Bars (fits all models)

JOINTER PAL® MAGNETIC KNIFE SETTING JIG

PATENT OWNED BY WOODSTOCK INTERNATIONAL INC.

Set jointer knives in perfect alignment every time!

W1210 Polycarbonate jig for 4" - 8" jointers w/HSS knives

W1211 Steel jig for 4" - 8" jointers w/HSS knives

W1212 Carbide jig for 4" - 8" jointers w/carbide or HSS knives

W1227 Carbide jig for 8" - 14" jointers w/carbide or HSS knives

W1228 Carbide jig for 12" - 18" jointers w/carbide or HSS knives

Aluma-Classic® FENCE

Extruded Aluminum & Steel Contruction
Precision Right Angle Design

Self-adhesive measuring tape & adjustable magnified cursor for quick positioning.

W1716 Aluma-Classic® Fence w/standard 57" rails

W1720 Aluma-Classic® Fence w/long 79" rails & legs (50" cutting capacity)

W1721 79" rails & legs (fence not included)

W1722 Set of 3 powder coated sheet metal wings

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May 2011 **Vol. 28, No. 2** **Issue No. 204**

Marlen designed, and his kids helped build, bud vases for holiday presents.

Karl crafted Scherenschnitte (scissor cuts) and quartersawn oak frames as family gifts.

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In Memoriam — E.T. Meredith III (1933–2003)

To see Lucas' blog about making these blocks, and download a PDF of the patterns, go to woodmagazine.com/blocks.

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Sounding Board

Our bulletin board for letters, comments, and timely updates

Readers dig Construction-Grade toys

Custom tracks add detail

I built the bulldozer in issue 199 (September 2010), as well as the excavator in issue 194 (November 2009). After finishing the dozer, I thought it would look better with typical web tracks. So I made my own. Here's how.

For less than $2 at a fabric store, I bought a length of 1½"-wide black elastic band. After measuring the circumference (the path around the wheels), I cut the band 2" shorter and sewed it together in a loop. Next, with the band in place on the dozer, I glued the cleats in place ¼" apart using cyanoacrylate glue. Although it might not hold up to the rugged play of a child, it sure looks nice.

—Glenn Main, Louisville, Tenn.

Please work safely

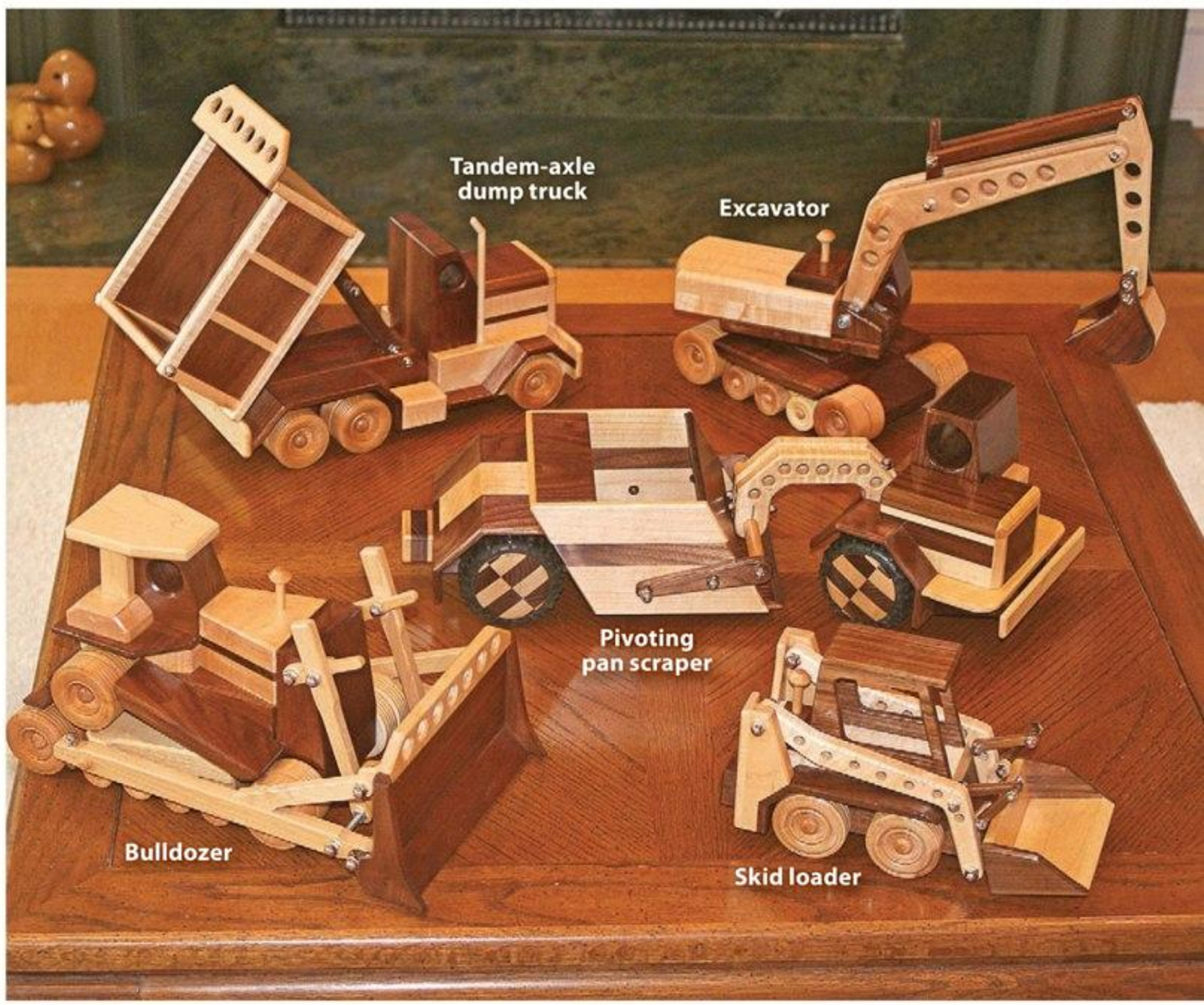
In order to show you precise details in photos, we frequently remove safety guards. In your work, be sure to use all safety devices, as well as wearing vision, breathing, and hearing protection.

—WOOD *magazine editors*

Eager builder adds three models to fleet

After making the excavator and bulldozer from your series of construction toys, they looked lonely. So I designed and built a tandem-axle dump truck, pivoting pan scraper, and a skid loader, as shown *below*. I maintained the scale as well as a few other themes from the series: the use of walnut and maple; machine bolts with acorn nuts; and store-bought wooden wheels. (I broke from the mold on the scraper by making my own wheels.) Thanks for the plans and the inspiration!

— Lauren Bowler, Bloomfield Hills, Mich.



If you're interested in making any of our Construction-Grade toys (bulldozer, excavator, crane), you can download project plans for each at woodmagazine.com/cgtoys for a small fee. And coming in the next issue (#205, July 2011), you'll find plans for a semi-tractor with two trailers: a side-dump hauler, and a lowboy for toting the other toys.

HOW TO REACH US

For woodworking advice:
Post your woodworking questions (joinery, finishing, tools, turning, dust collection, etc.) on one of our online forums at **woodmagazine.com/forums**.

To contact our editors:
Send your comments via e-mail to **woodmail@woodmagazine.com**; or write to *WOOD* magazine, 1716 Locust St., LS-221, Des Moines, IA 50309.

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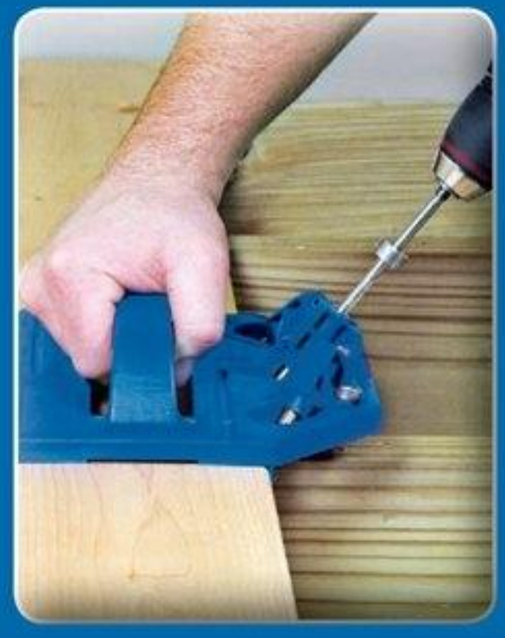

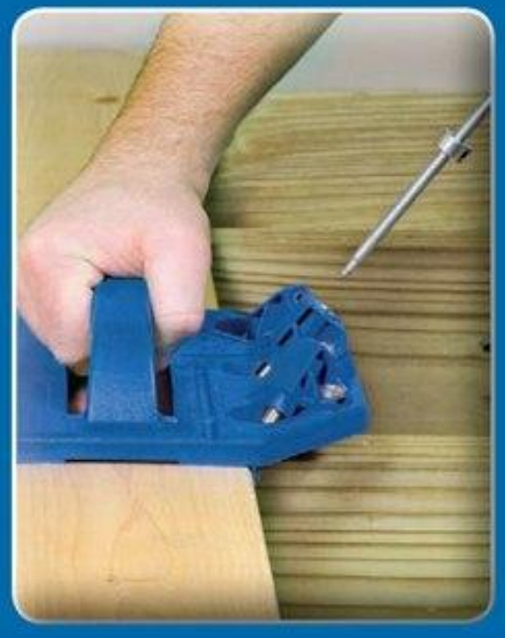

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Shop Tips

Helping you work faster, smarter, and safer

Top Shop Tip

Miter gauge stops keep sliding fences accurate

I like to keep the fence of my aftermarket miter gauge close to the blade to support the cut. But when I rotate the gauge for angled cuts, I must slide the fence out along the gauge head to prevent cutting into it. Unfortunately, after doing so, I have to recalibrate the tape on the fence.

To make this easier, I made a pair of small hardboard stops that attach to the fence's T-track and register the miter gauge head with the fence positioned for 90° cuts. Simply loosen one stop, and slide it aside to move the fence for angled cuts. Once you're finished, slide the fence until it butts against the other stop, and your tape again measures accurately.

—Cliff Furman, Englewood, Fla.

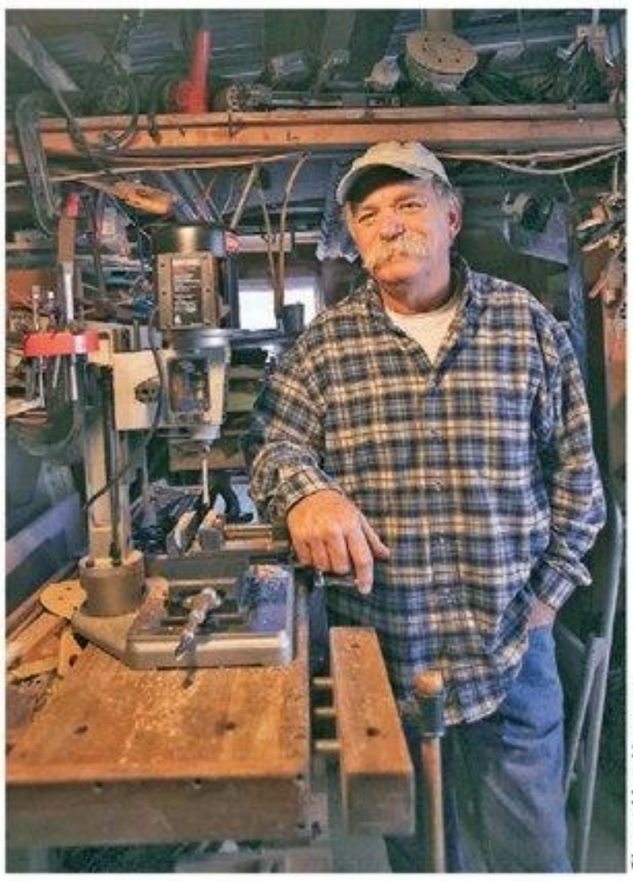
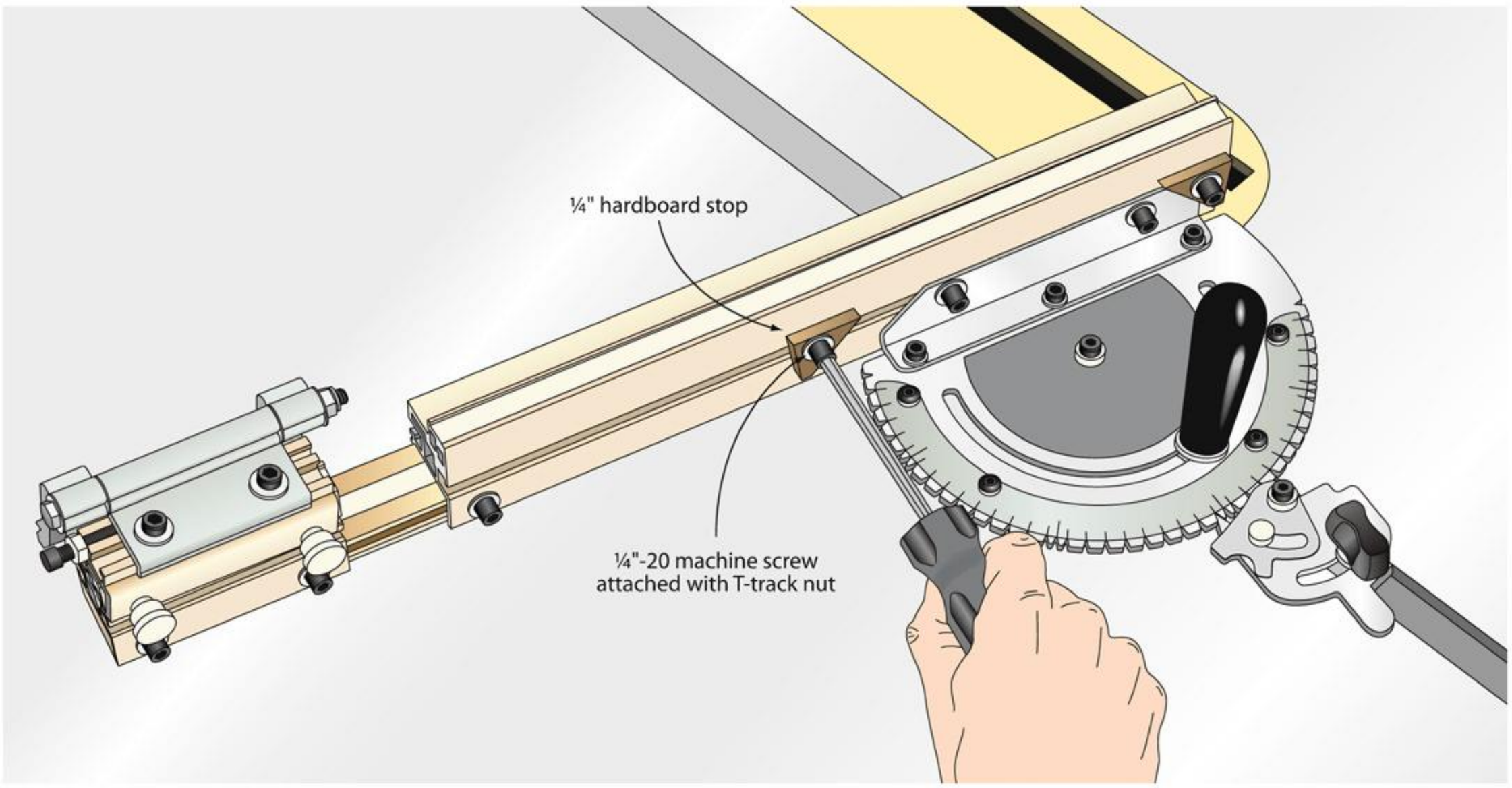


Photo: Matt Houston

For sending in this issue's Top Shop Tip, Cliff Furman gets the MRC23EVSK two-base router kit from Bosch. Way to go, Cliff!



continued on page 10

Your tips earn cash, tools!

Tell us how you've solved a workshop stumper. If we print it, you'll get $100 and a DVD copy of *Woodworking Secrets: Tips & Techniques* (woodmagazine.com/tipsdvd). And, if your idea garners Top Shop Tip honors, we'll also reward you with a tool prize worth at least $300.

Send your best ideas, along with photos or drawings and your daytime phone number, to **Shop Tips, *WOOD* Magazine, 1716 Locust St., LS-221, Des Moines, IA 50309-3023**.

Or, by e-mail: shoptips@woodmagazine.com. Include your contact info in the e-mail.

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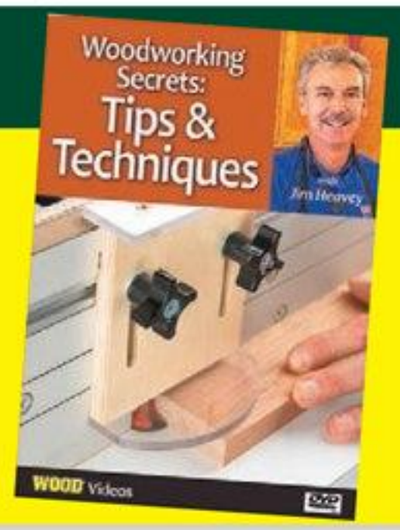

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1.5 HP Motor
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1 Micron Filtration
Portable!
42 Gallon Bag

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$419.00

The JDS 1.5 HP Dust-Force is perfect for small shops. The unit can be used with short duct runs or dedicated to a single machine. It is also portable and can be rolled around the shop with ease. The powerful 1.5HP motor produces 1250 CFM maximum airflow. The TEFC motor has an aluminum housing that keeps the motor cool and quite. The plastic collection bag provides 42 gallons of capacity. The 1 micron bag filters down to 1 micron dust particles preventing fine dust from escaping into your shop. The 1 micron canister has 5 times the surface area of the bag and provides better airflow as well as high filtration.

3HP Cyclone

2300 Max CFM!
Self Cleaning 1 Micron Filter
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55 Gallon Drum
Portable!
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With high performance and more features, the JDS 3HP Cyclone is raising the bar for 2-stage dust collectors. The TEFC motor has an aluminum housing that keeps it cooler and helps it run more efficiently. The "Turbo-Fan" impeller produces high amounts of CFM when placed under high amounts of resistance. Removing the steel drum is quick and easy, just lift up the drum lid lever and roll out the drum. The self cleaning 1 micron canister filter has a motor that automatically rotates flappers inside the filter knocking dust down into a collection bag.

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WOOD MAGAZINE TOP NEW TOOLS 2009

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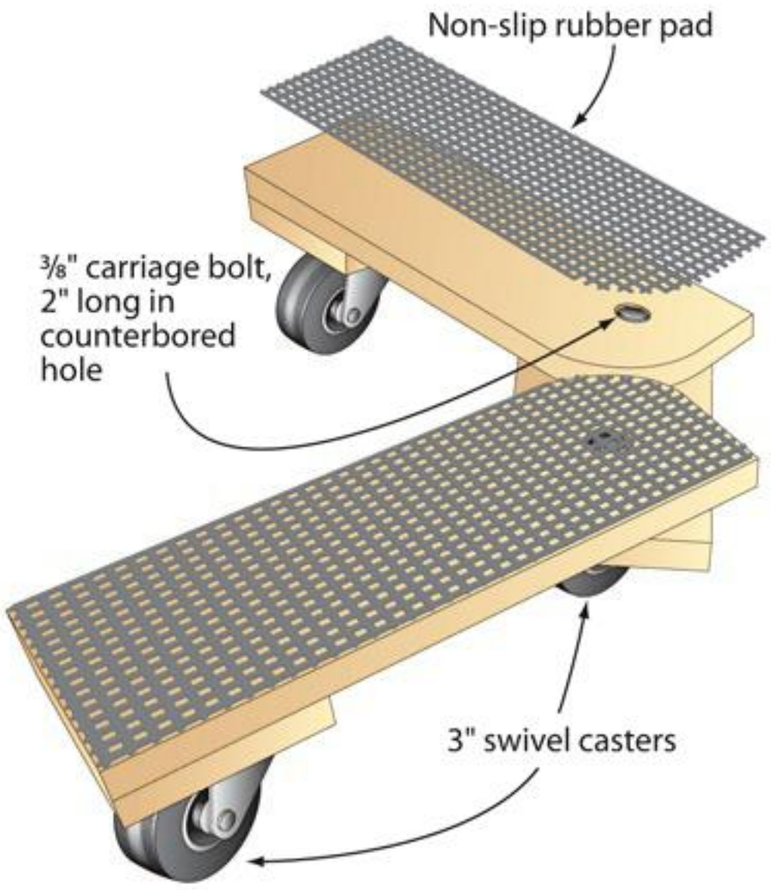
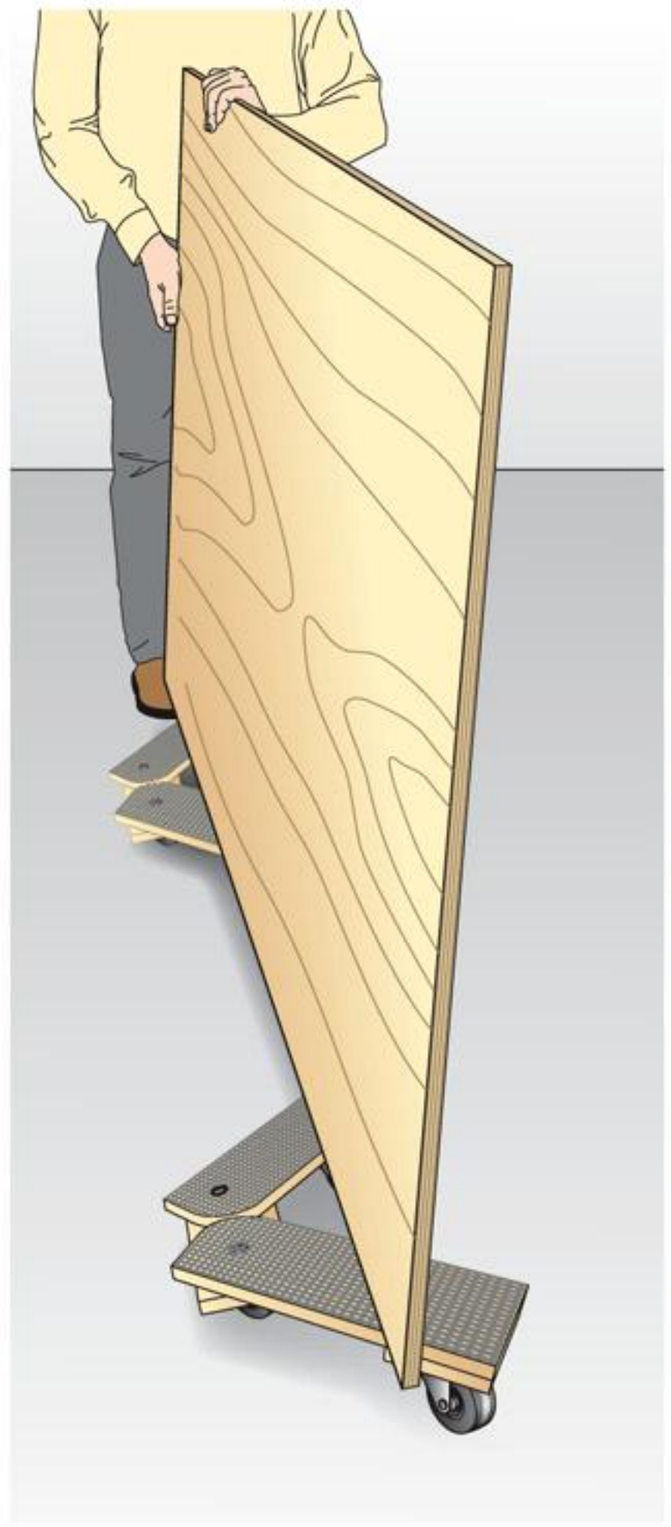
Shop Tips

Fold-away lumber trikes

These lumber trikes work perfectly for moving sheet goods or stacks of lumber around your shop. When not in use, the trikes fold away, taking up little space.

—Dick Ayers, Barron, Wis.

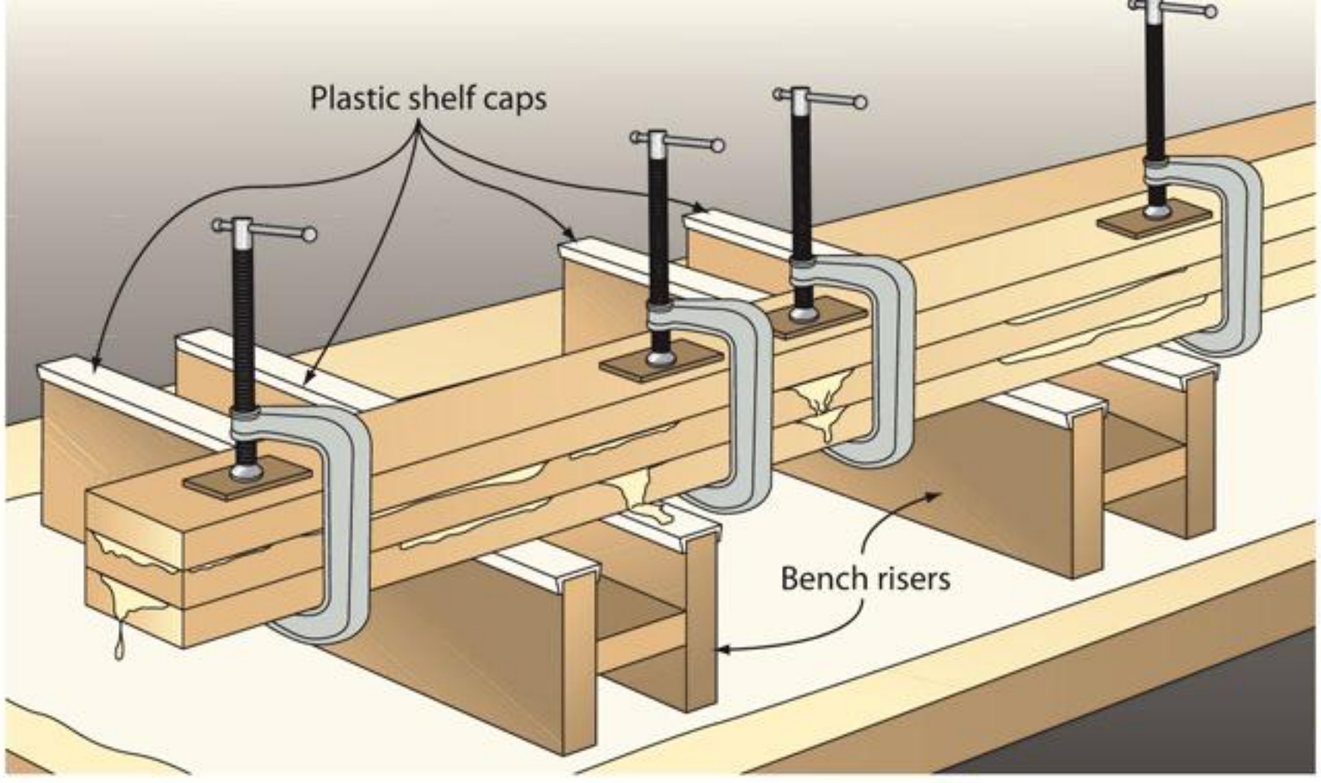




Keep it clean with glue edge guards and clamp-caul cappers

I made bench risers similar to those in *WOOD®* magazine issue 193 (October 2009), but I added one improvement: plastic, U-channel shelf caps from the hardware store. Because they're made to conceal particleboard shelving edges, they fit ¾" stock perfectly. They protect the risers from messy glue-ups so well, I went ahead and added them to my collection of clamping cauls.

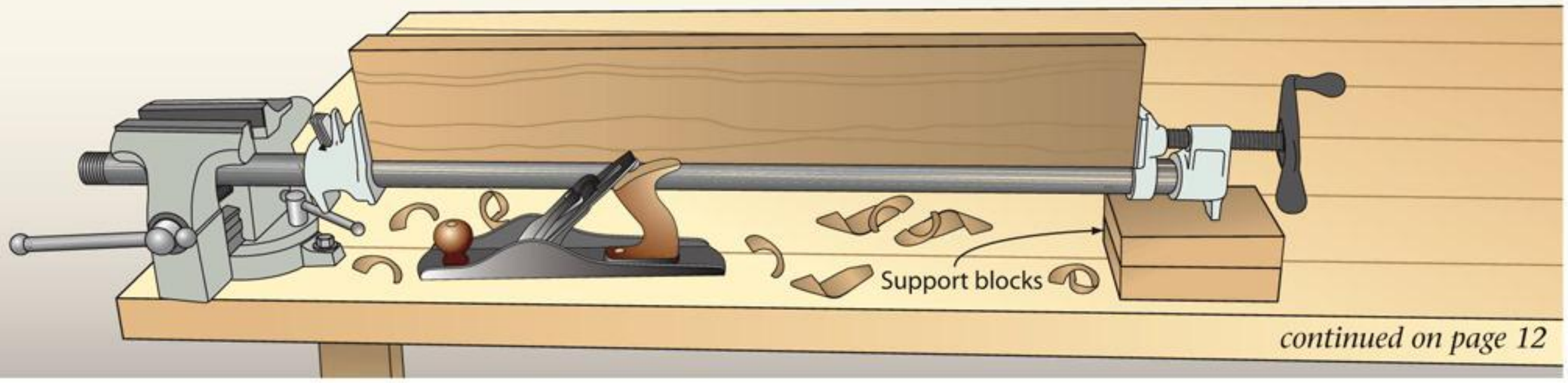
—Serge Duclos, Delson, Que.



Turn a machinist's vise into a tail vise

Here's a trick I came up with when I wanted to do some hand-jointing on a long workpiece: Secure one end of a long pipe clamp in your machinist's vise, prop up the screw end of the clamp with support blocks, and clamp your workpiece. This arrangement provides rigid support in only a few seconds, and gives you all-around access to the workpiece.

—Bill Wells, Olympia, Wash.



continued on page 12

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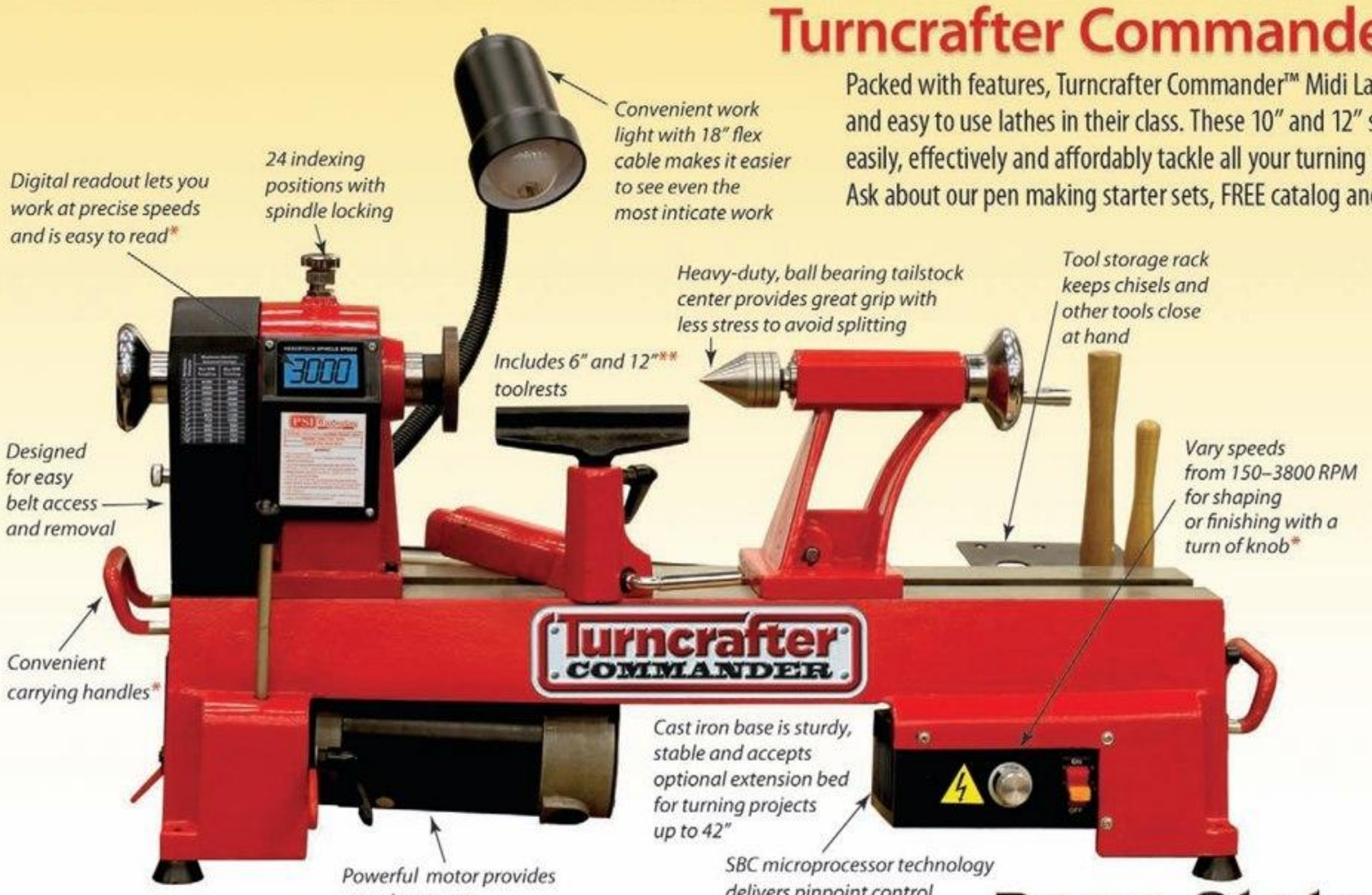
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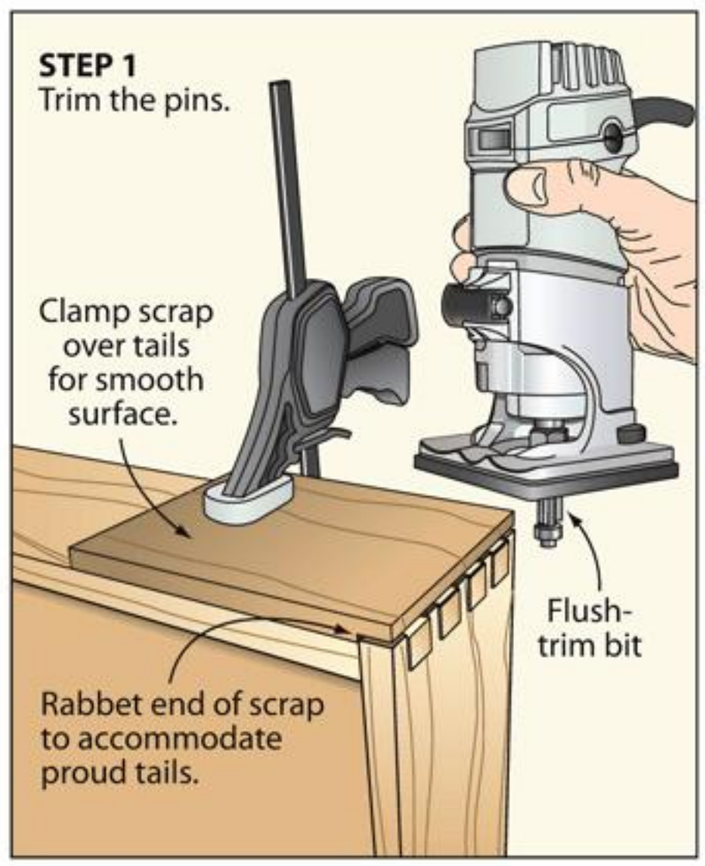
Shop Tips

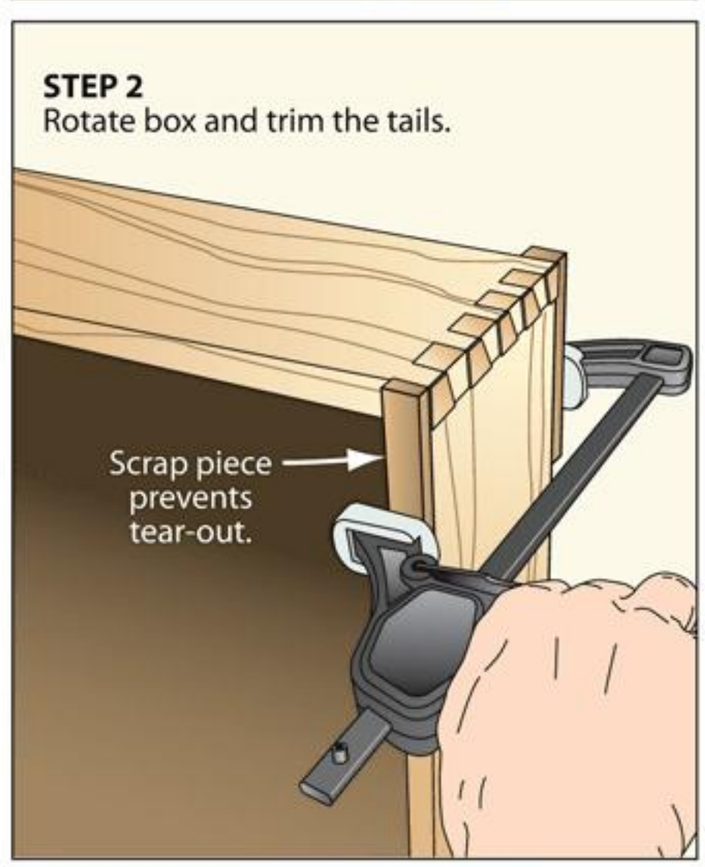
Proud dovetails get cut down to size

When cutting through dovetails, I leave the pins and tails a hair proud. But sanding them down afterward can prove to be tedious. To quickly and cleanly trim dovetail joints, use a handheld router with a 1"-long flush-trim bit.

To trim the pins, rabbet the end of a scrap board to accommodate the proud tails; then clamp the board over the tail side, as shown *below*, to give the router a smooth surface on which to ride. With the pin side flat, trim the tails by clamping two pieces of sacrificial scrap to the edges of the sides to prevent tear-out from the cross-grain routing. Finally, a few minutes with a palm sander or sanding block will yield a perfect dovetail joint.

—Steven Gaddis, Winston, Ore.

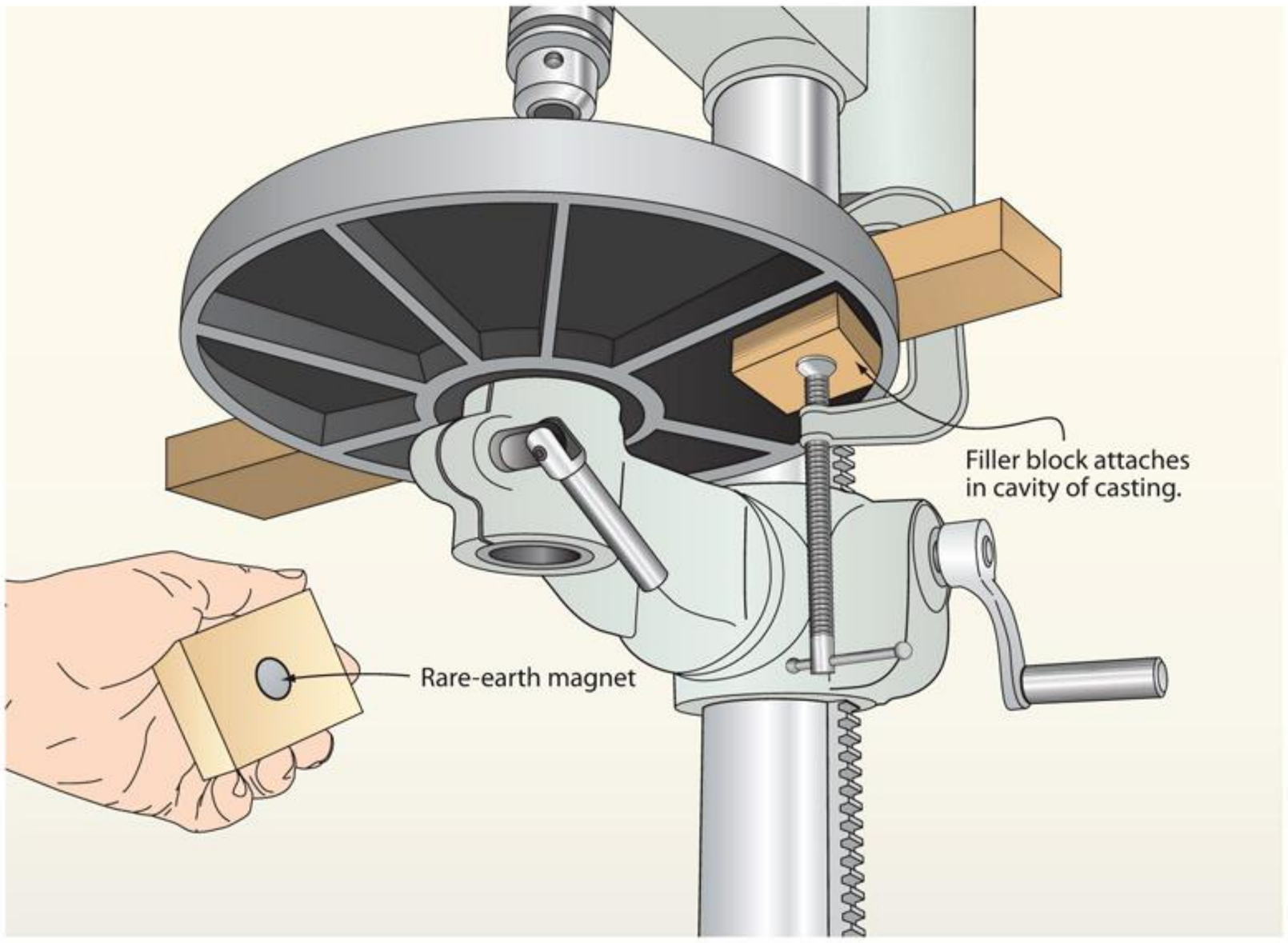

STEP 1
Trim the pins.
Clamp scrap over tails for smooth surface.
Flush-trim bit
Rabbet end of scrap to accommodate proud tails.



A stick-to-your ribs clamping solution

Here's a quick way to clamp jigs or fences to the undersides of ribbed cast-iron tables, such as those often found on drill presses. In a scrap of wood the same thickness as the recess in the bottom of your table, drill a counterbore and epoxy in a rare-earth magnet to create a filler block that stays put.

—Charles Mak, Calgary, Alta.



continued on page 14

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Compact! Only 77" High

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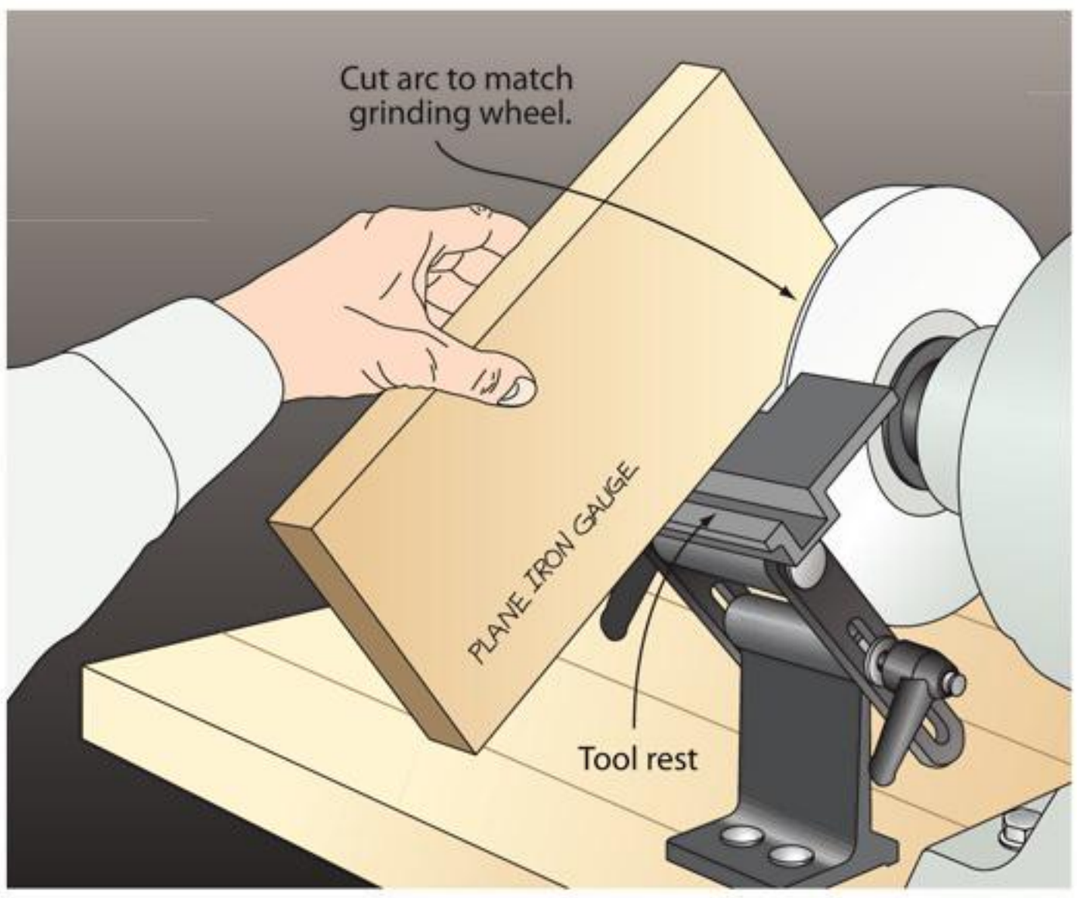
Shop Tips

At-a-glance grinder gauge

Here's a simple way to reset your grinder's tool rest to the correct angle. After adjusting the angle just where you want it, lay a scrapwood block on the table alongside the grinder wheel and trace the curve of the wheel onto the block. Saw just on the waste side of the curved line, and then "grind" the shape of the wheel into the curve for a perfect fit. Next time you need to sharpen that tool, use the block as a gauge to position the tool rest.

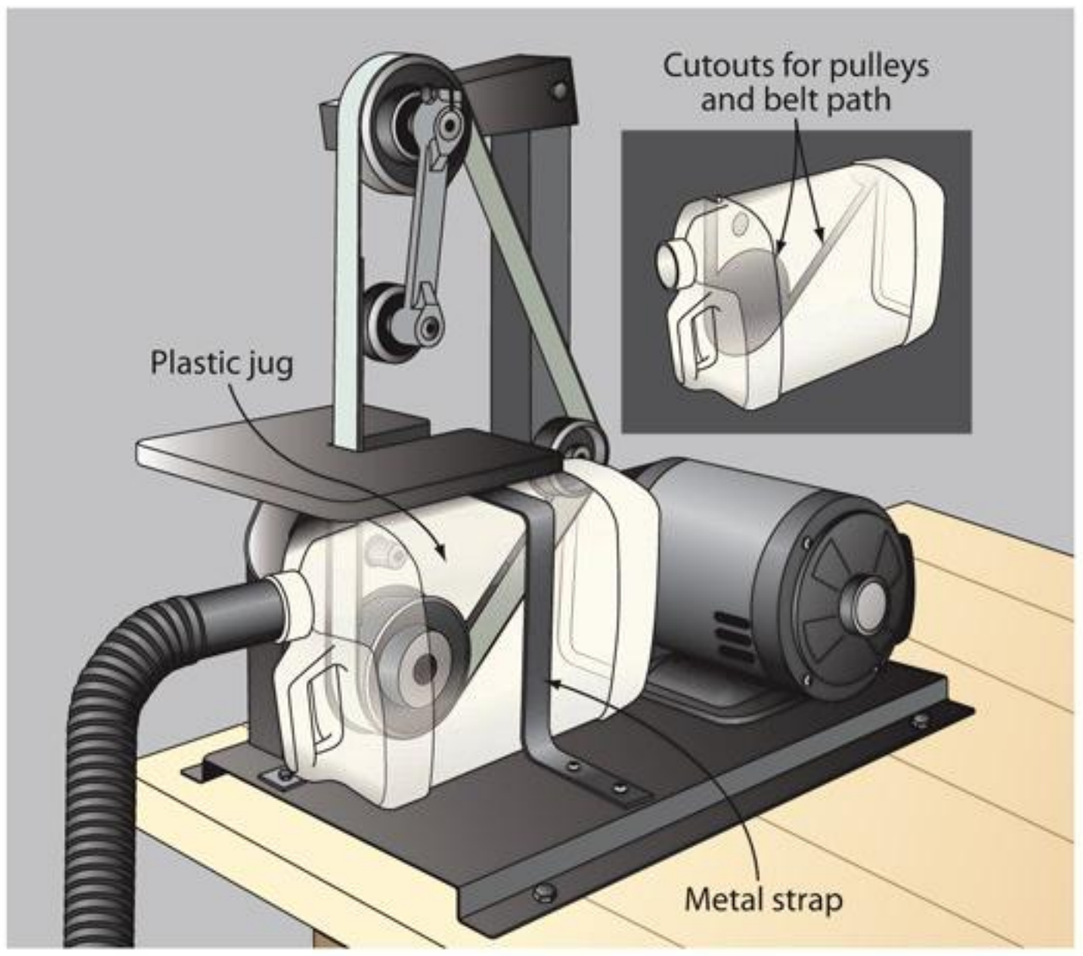
—Carl Johnson, Elmhurst, Ill.



A gallon of dust collection for an inch of sander

The 1" belt sander was the final frontier of dust collection in my shop. I conquered it using a rinsed-out 1-gallon plastic bleach jug. After some careful tracing and cutting, the jug enclosed the belt and pulleys, and I strapped it to the sander, as shown. When I hooked up my shop-vacuum hose to the jug mouth, it proved a surprisingly effective dust trap.

—Erv Roberts, Windsor Heights, Iowa



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Elegant and Easy

Federal Pediment Mirror

Construct this mirror in a weekend, then enjoy it for a lifetime thanks to its ultra-sturdy mitered half-lap joinery and timeless styling.

1 From ¾" stock, cut the stiles (A) and rails (B) to size. Follow the directions on *page 20* to create the mitered half-laps. Rout the ⅜" rabbets ⅛" deep on the back of the frame parts and the ¼" coves on the inside front edges, as shown **[Drawing 1]**. Then glue and clamp the frame (A, B) and set it aside to dry.

2 From ¼" stock, cut the stile trim (C), rail trim (D), and pediment trim (E) to size plus 1" in length. Rout ⅛" round-overs on the front edges of each trim piece. Miter-cut the stile trim (C) and rail trim (D) to final length, test-fitting them around the assembled frame (A/B) to fine-tune their lengths. Then glue them to the frame, positioning them to overlap the back of the frame by ¼". The overlap of the trim will hide the edges of the back (G).

3 To create the pediment (F), cut a piece of walnut to ¾×3¾×22⅜". Lay out the pediment **[Drawing 2]** on the blank. Drill the ⅞" holes in both ends where dimensioned on the drawing. Use a Forstner bit or holesaw to drill the 2⅛" hole on the top. Then cut the blank to its final length and width before making the angled cuts along the top edge using a bandsaw or a tapering jig on the tablesaw. Use a bandsaw to open up the top circle.

Cut the pediment trim (E) to final length and round over the ends. Glue

continued on page 18

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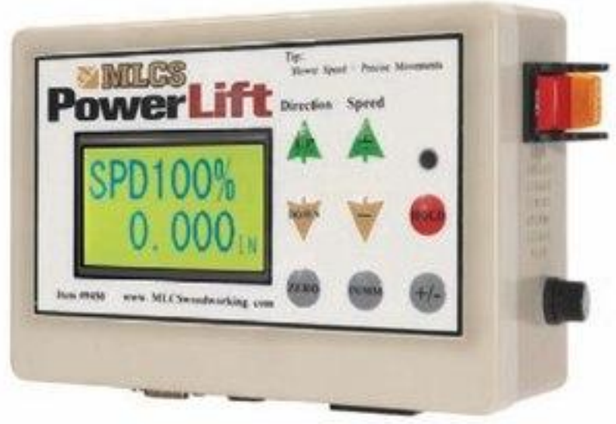
Only The PowerLift... has a **Digital Control Panel** (with mounting arm included), so you can set the speed, direction, and height of the lift.



Only The PowerLift...
DC motor action allows you to change the router bit above the table in seconds.

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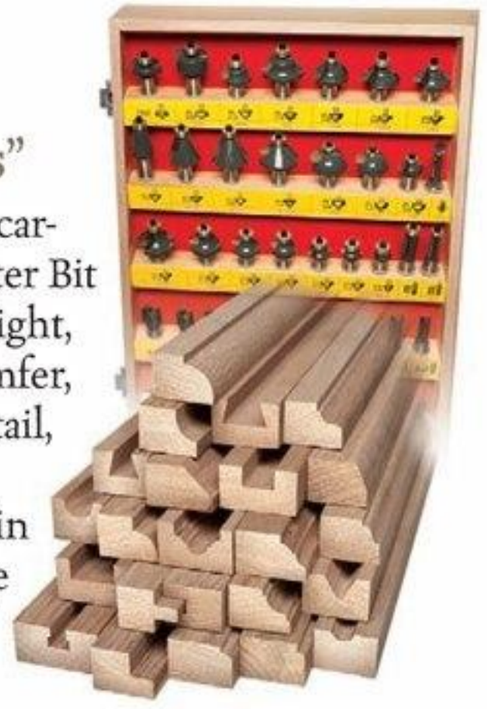

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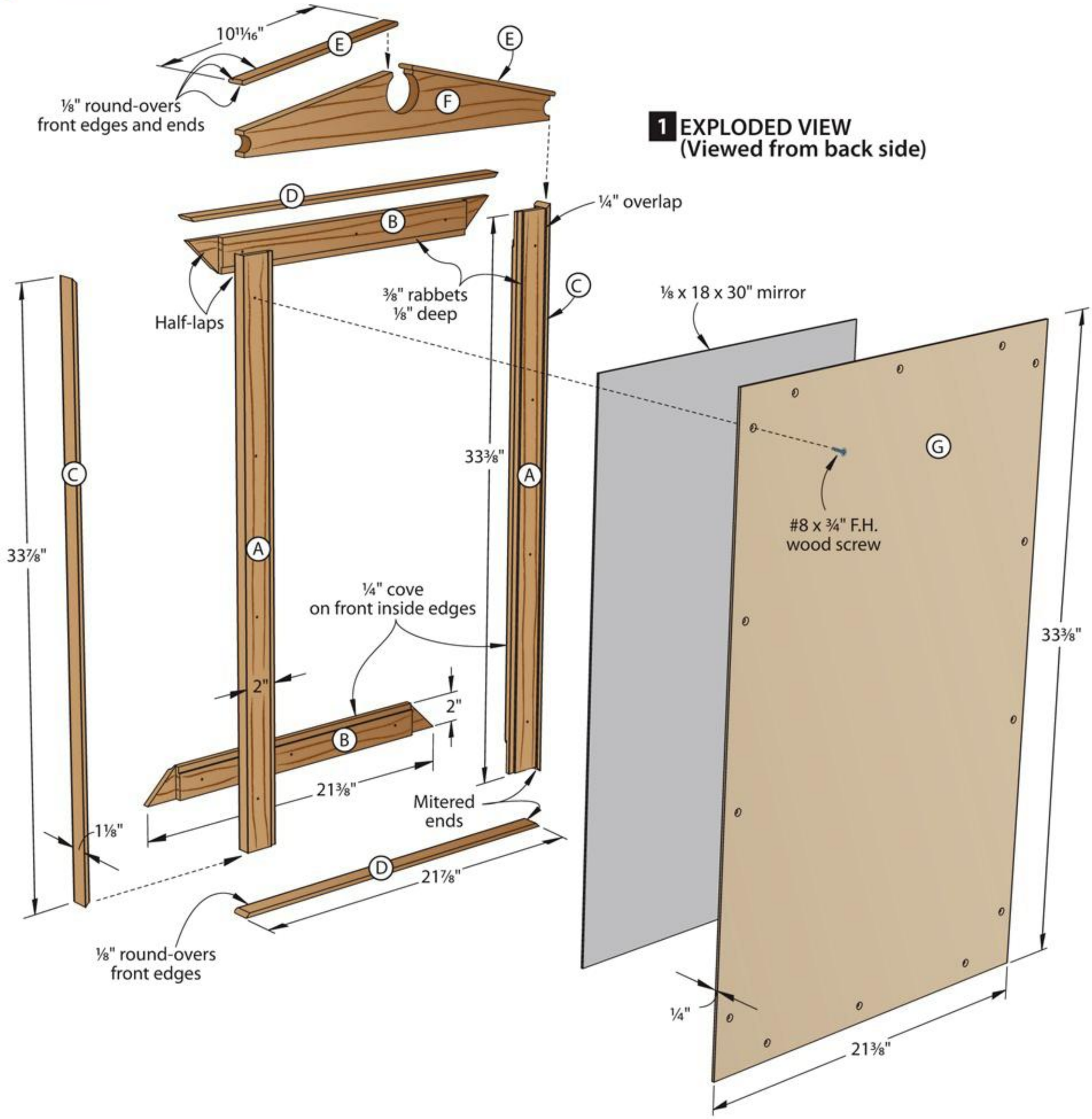
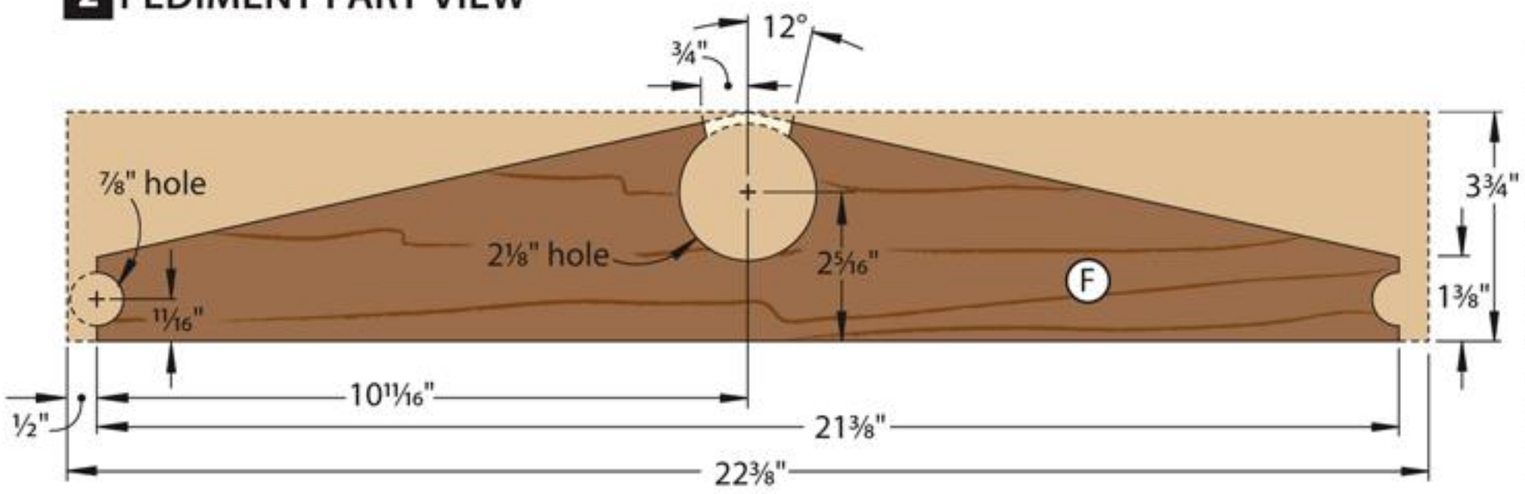


1 EXPLODED VIEW
(Viewed from back side)

2 PEDIMENT PART VIEW



the trim to the top of the pediment. Glue the pediment, centered, to the top of the mirror frame.

4 Sand all surfaces to 220 grit, vacuum, and apply three coats of clear satin finish.

Cut the back (G) to size. Fit the frame with a ⅛×18×30" mirror secured in place by the back, screwed to the frame with #8×¾" wood screws. Then step back and take a look at the proud builder of a new mirror.

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	stiles	¾"	2"	33⅜"	W	2
B	rails	¾"	2"	21⅜"	W	2
C*	stile trim	¼"	1⅛"	33⅞"	W	2
D*	rail trim	¼"	1⅛"	21⅞"	W	2
E*	pediment trim	¼"	1⅛"	10¹¹⁄₁₆"	W	2
F*	pediment	¾"	3⁹⁄₁₆"	21⅜"	W	1
G	back	¼"	21⅜"	33⅜"	H	1

*Parts initially cut oversize. See the instructions.

Materials key: W–walnut, H–tempered hardboard.
Supplies: #8×¾" flathead wood screws (14), ⅛×18×30" mirror.
Bits: Rabbeting, straight, ⅛" round-over, and ¼" cove bit router bits; ⅞" Forstner bit, 2⅛" Forstner bit or holesaw.

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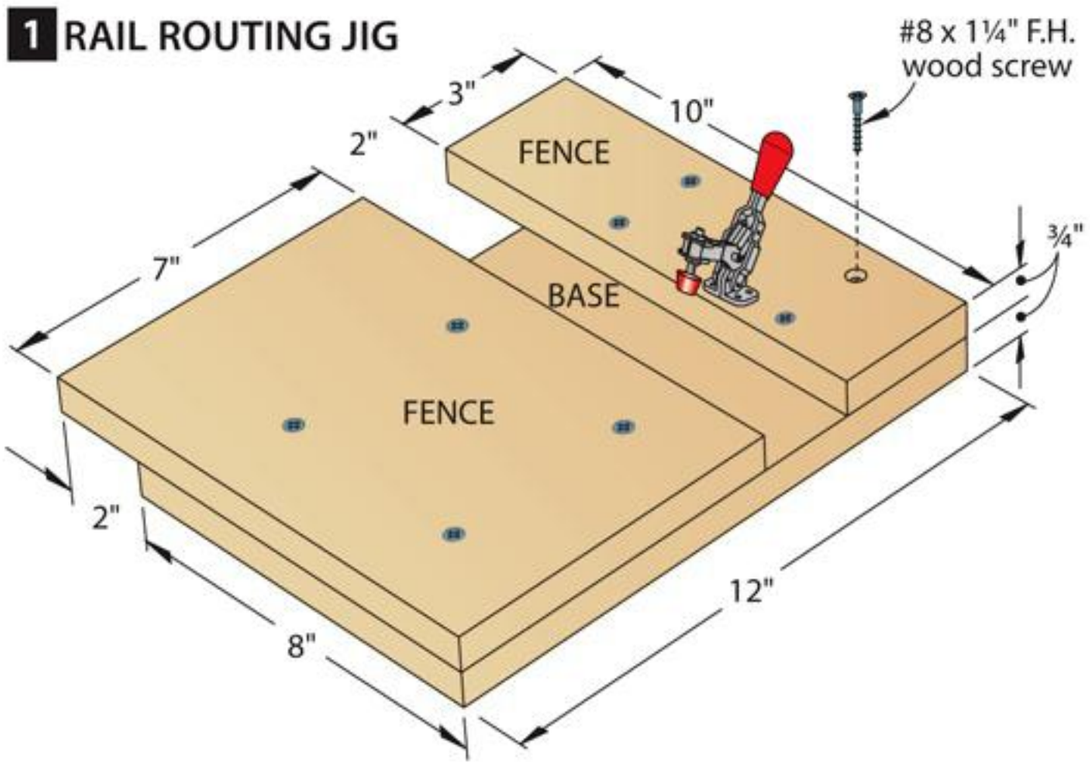
With seven years of bad luck on the line, you'll want more than an end-grain to end-grain miter joint cradling the hefty mirror glass on *page 16*. Fortunately, thanks to a couple of easy router-table jigs, you'll be cranking out mitered half-laps quickly and accurately.

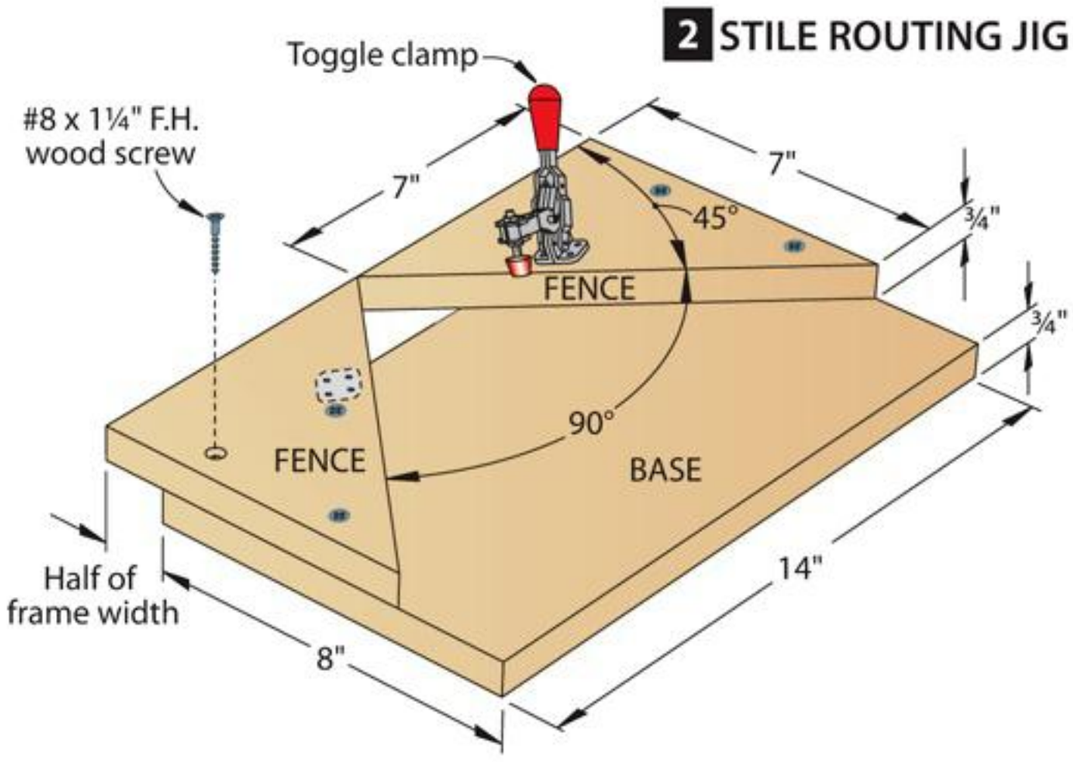
Start by machining your frame stock to thickness and width. Assemble the rail routing jig **[Drawing 1]** and the stile routing jig **[Drawing 2]**, designed to work with 2"-wide frame stock. For a different width, customize the rail routing jig by making the fence overlap and the

continued on page 22

1 RAIL ROUTING JIG



2 STILE ROUTING JIG



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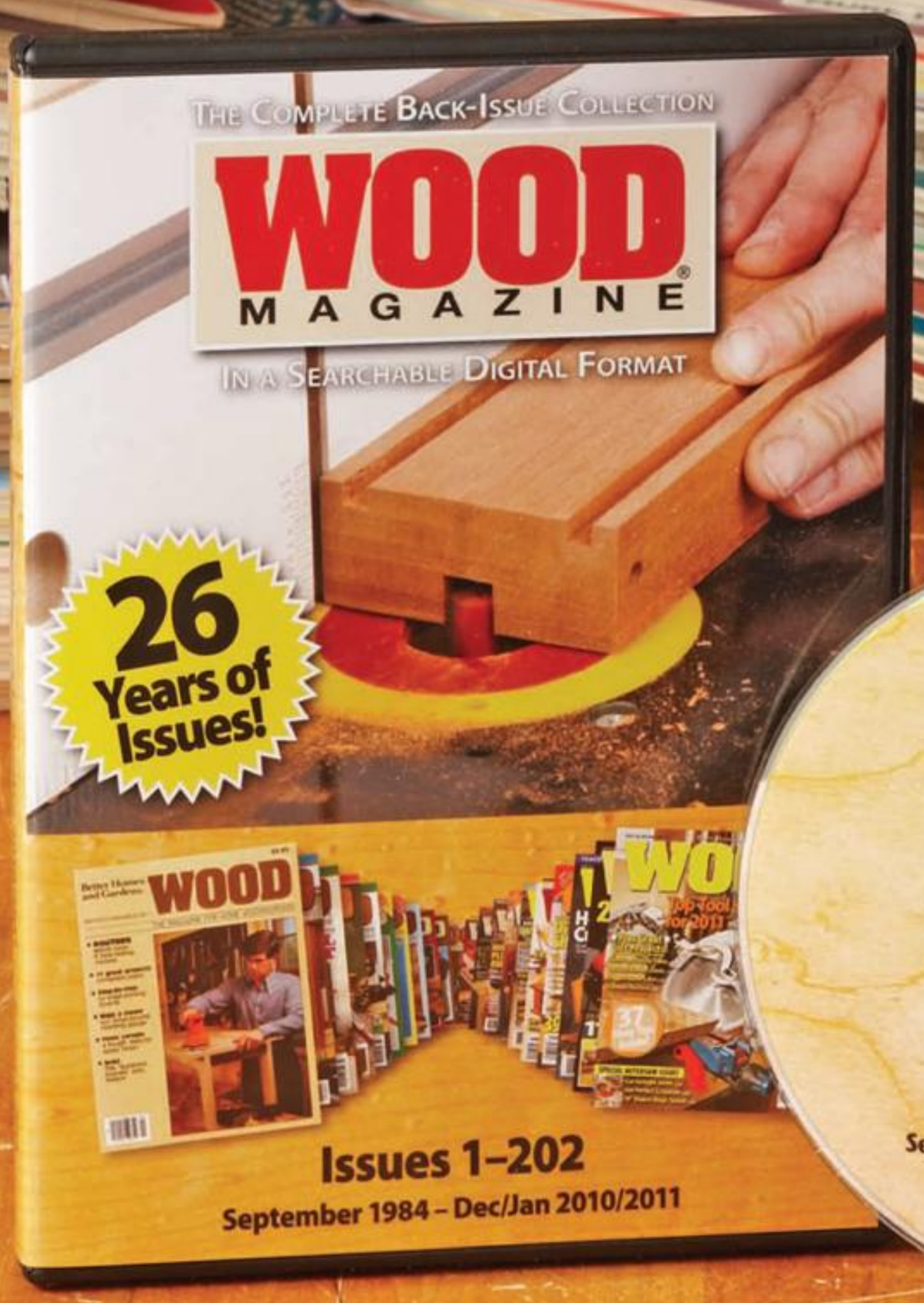

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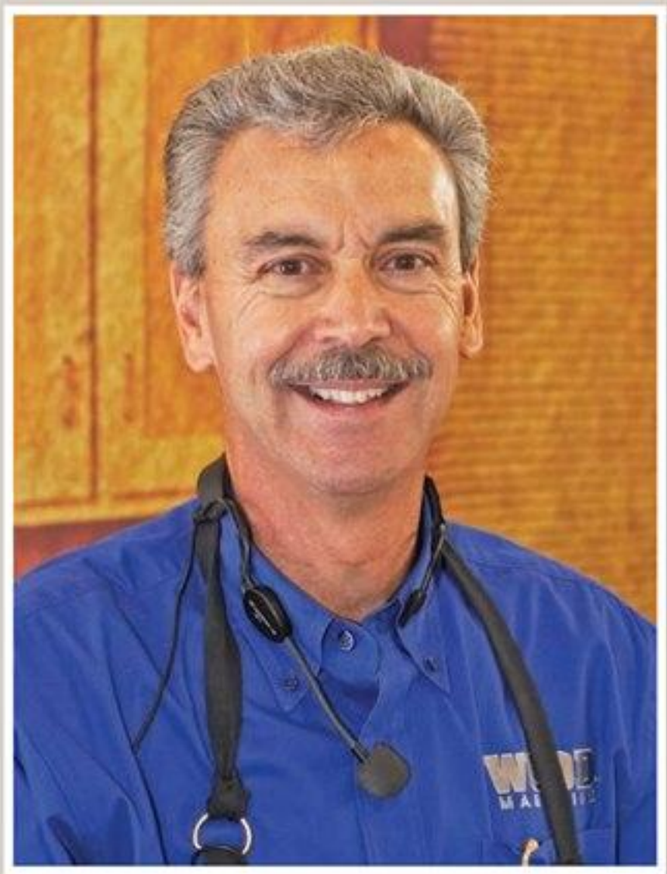

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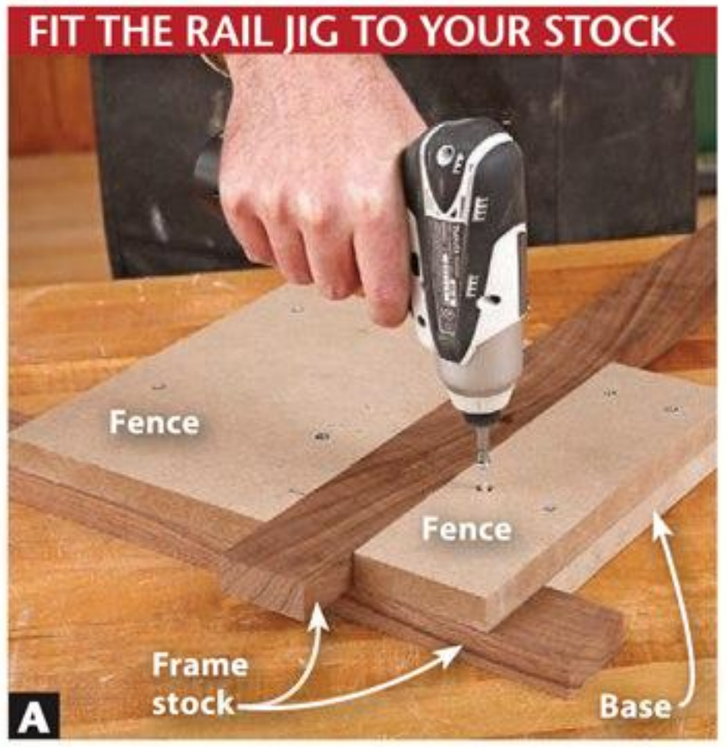
slot between fences the same width as your frame stock **[Photo A]**. Then adjust the stile routing jig by making the fence overlap exactly half the width of your frame stock.

Cut the frame stiles and rails to the final height and width of your frame, mitering the ends of the *rails only*. Chuck a ½" straight bit into your table-mounted router and set the bit's height to remove half the thickness of the rail and stile stock. Then follow these four simple steps to set up and cut the mitered half-laps.

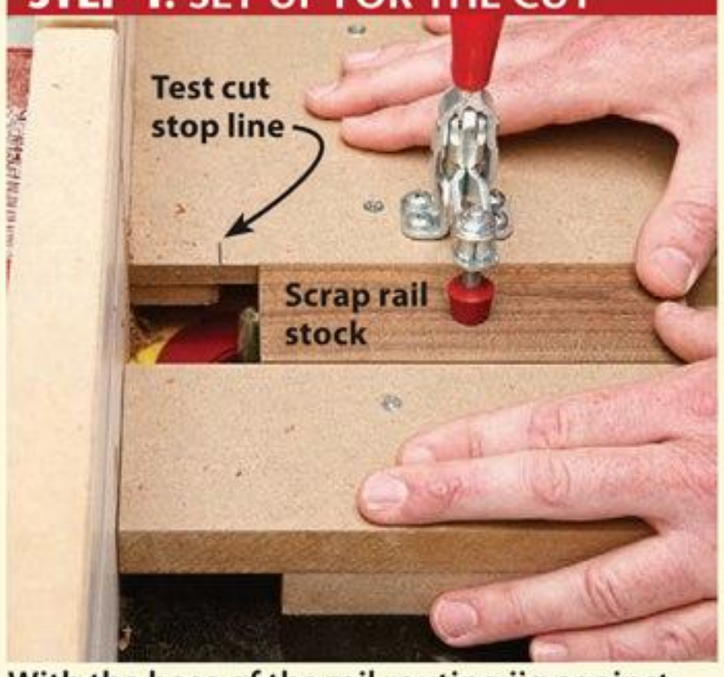
FIT THE RAIL JIG TO YOUR STOCK



Position and attach the fences so they match the width of your frame stock. Ensure that the stock slides freely in its slot.

4 Easy Steps to Tight Miters

STEP 1: SET UP FOR THE CUT

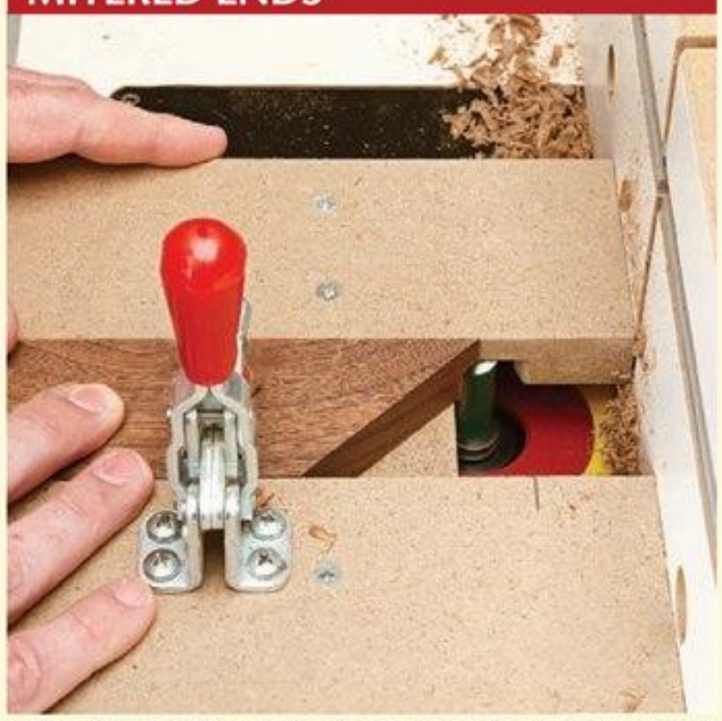


With the base of the rail routing jig against the bit's cutting edge, lock the fence against the jig. Clamp scrap stock in the jig and make a test cut by running the jig against the fence. Advance the stock for subsequent cuts.

STEP 2: STACK THE STOCK UP

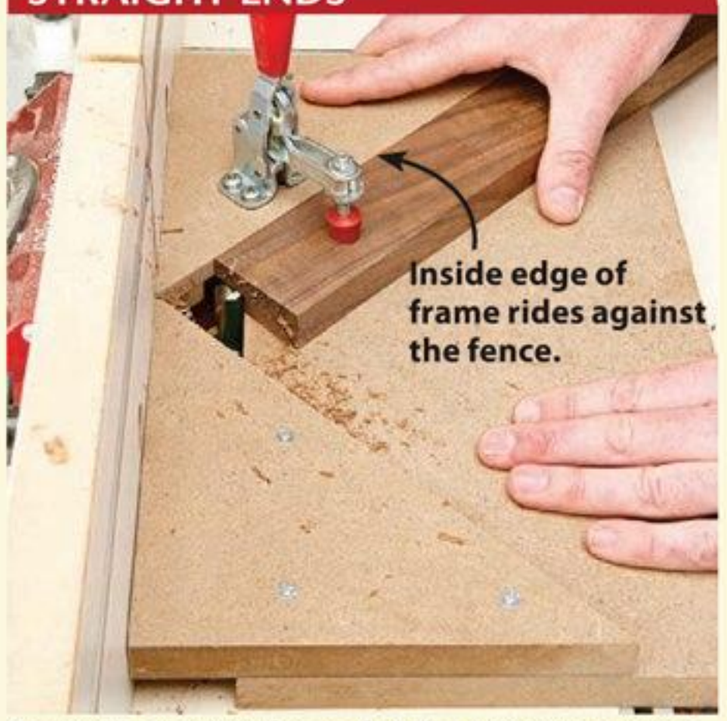
Rout test half-laps on two pieces of scrap frame stock and check the height by stacking the half-lapped stock on a flat surface, as shown. Dial in the bit height until the tops of both scraps are perfectly flush.

STEP 3: USE THE RAIL JIG FOR MITERED ENDS



With the bit height set, clamp the mitered rail stock *face up* in the rail routing jig for the first cut, as shown. Advance the rail and repeat until the mitered tip of the rail touches the router fence for the final cut.

STEP 4: USE THE STILE JIG FOR STRAIGHT ENDS



Reset the router fence for the stile jig as you did in Step 1. Clamp the stile against one of the fences, *face down*, and rout the half-lap with multiple cuts. Use the opposite fence to rout the other end of the stile.

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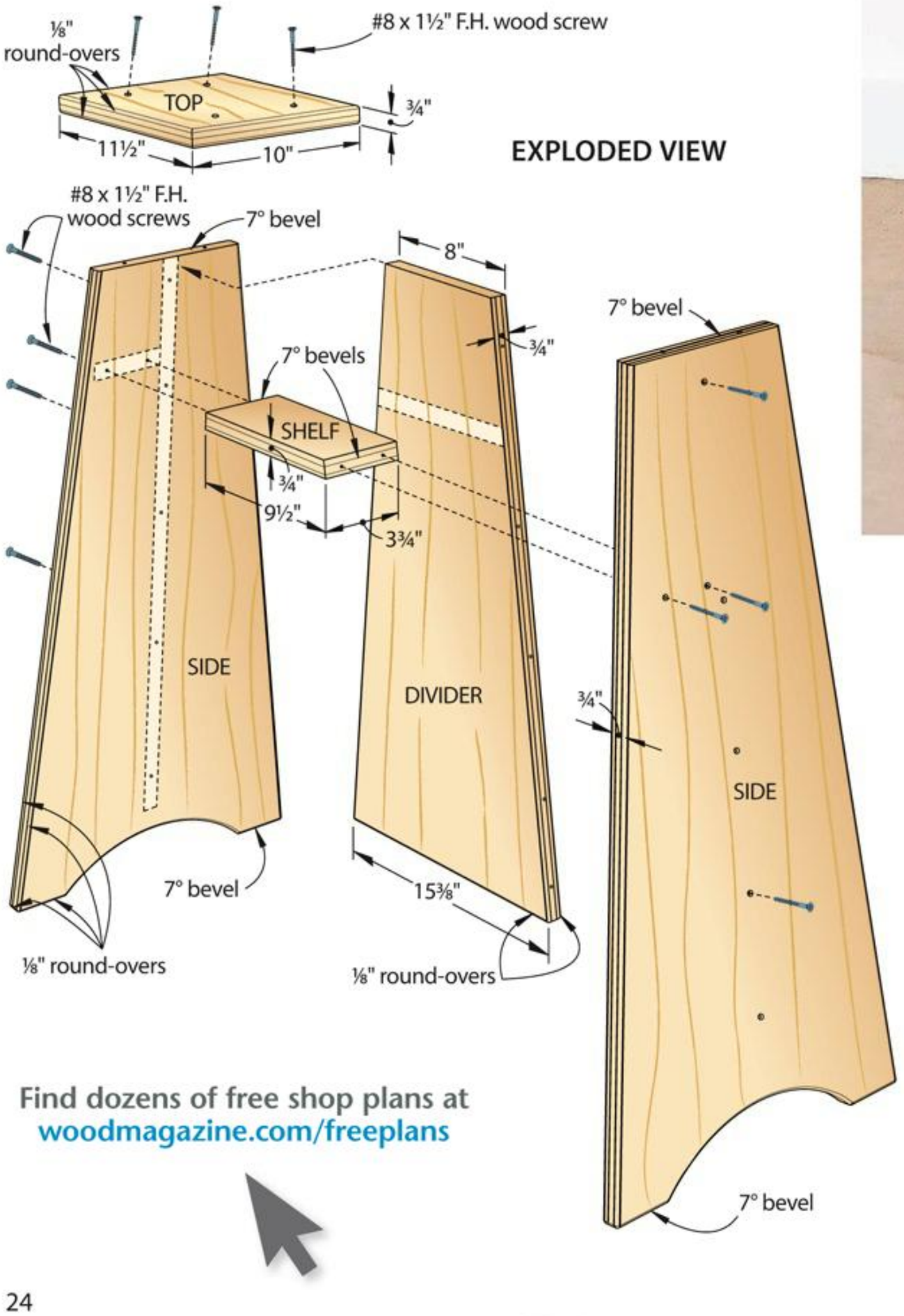

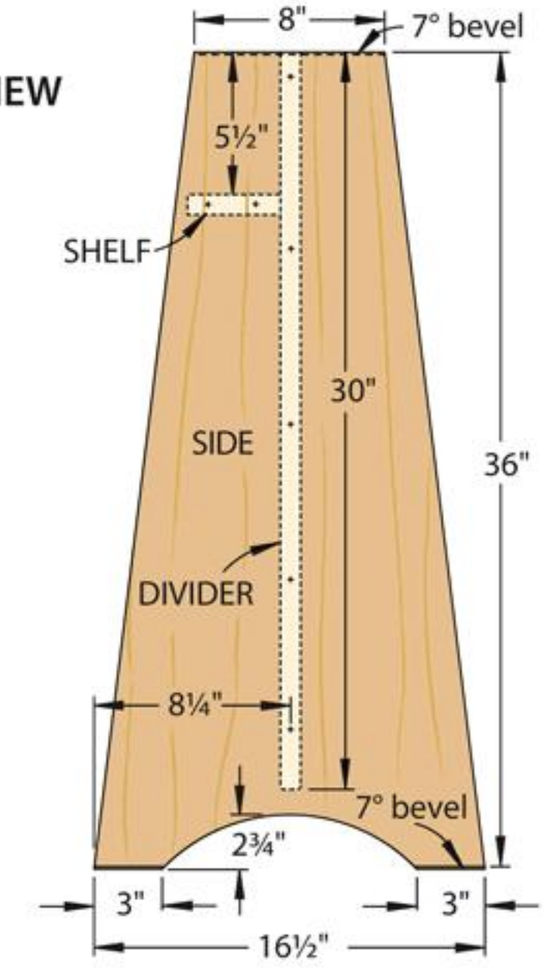

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Why buy?

Woodworkers use this tool mainly for sharpening, but also for grinding down hardware, and, with wire wheels or cloth buffing wheels, cleaning and polishing. A variable-speed machine better suits this wide range of jobs than a single-speed, 3,450-rpm model. Slow the tool for sharpening; use higher speeds for cleaning, buffing, and polishing.

We prefer an 8" grinder because the 1"-wide wheels provide a broad sharpening surface, and the fast rim speed grinds and polishes quickly. 6" models cost less, but cut slower (better for sharpening), and provide only ¾"-wide wheels.

We tested 11 slow- and variable-speed models and found these three offer good value for the daily grind.

CRAFTSMAN 21162 (8") $160; 21154 (6") $100

21162 (8") shown

Wheels: 60-grit silicon carbide, wire brush
RPM: 1,800–3,315 (8"); 1,870–3,180 (6")

Test-drive:

If you change wheels frequently, you'll appreciate this grinder. Removing just one threaded knob frees the wheel cover. An included wrench holds the motor shaft while you loosen the arbor nut. The same wrench helps you loosen the tool rests for sliding them forward and back.

The grinding wheel works for touching up tool edges, and I used the wire wheel to clean rust from an old hand plane.

The included accessories offer a mixed bag of performance: The star-wheel dressing tool works fine for truing 60-grit and coarser wheels; a drill-bit sharpening plate mounts on either tool rest (but I had little luck reviving bits with it); a handy quench cup clips to the base and holds water for cooling tools while sharpening.

The 6" and 8" versions of this grinder have near-identical features, so let your needs and wallet dictate your choice.

Get it if: You need rough grinding as well as wire-wheel cleaning.

Forget it if: You expect razor-sharp tools from the 60-grit wheel.

—Tested by Craig Ruegsegger, Projects Editor

To learn more:

800-549-4505; craftsman.com

PORTER-CABLE PCB575BG (8") $119; PCB525BG (6") $79

PCB575BG (8") shown

Wheels: 36- and 80-grit silicon carbide
RPM: 2,075–3,425 (8"); 2,065–3,435 (6")

Test-drive:

The wheels of these similarly featured grinders cover a wide range of tasks, from rough grinding to touching up woodworking tools. Both grinders run nearly vibration-free, with smooth rpm changes across the variable-speed range.

Threaded knobs make positioning the tool rests and safety shields easy. The poker-chip-like interlocking ridges in the tool rest and mount provide solid, repeatable positioning, but prevent fine-tuning between those gradations.

A T-shaped, diamond-embedded dressing tool stores on the back of the base and a quench cup sits up front.

Two gripes: I didn't care for the drill-bit-sharpening groove cast into the left tool rest, as narrow chisels tended to dip into it. And the task light only comes on when the motor is running, so it can't be used when setting up the grinder.

Get it if: Sharpening chores range from lawnmower blades to chisels.

Forget it if: You want a grinder mostly to touch up woodworking tools.

—Tested by Lucas Peters, How-to Editor

To learn more:

888-848-5175; deltaportercable.com

WOODCRAFT 150780 (8") $110

Wheels: 60- and 120-grit aluminum oxide
RPM: 1,790

Test-drive:

This affordable, single-speed grinder doesn't offer a task light or a dressing tool, but in exchange you get high-quality, aluminum-oxide wheels meant for sharpening tools. And for what those wheels would cost as an upgrade, you could easily add a light and dressing tool, and still be money ahead.

The grinder's slow speed means minimal vibration: It stayed put on my bench, even without clamping it in place.

However, I had to double-faced-tape wedges to the fixed-angle tool rests to hold my plane irons at the proper angle. Adusting the tool rests forward and back requires a wrench that you provide.

Although you could mount a wire wheel or buffing pad, doing so requires removing five screws from the wheel cover. And the slow speed means jobs with these accessories will take longer.

Get it if: You touch up woodworking tool edges frequently.

Forget it if: You're not willing to work a bit to set it up.

—Tested by Karl Ehlers, Art Director

To learn more:

800-225-1153; woodcraft.com

✓Yes

✓Yes

✓Yes

✓Yes

✓Yes

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✓Yes

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Quick & Easy Jig

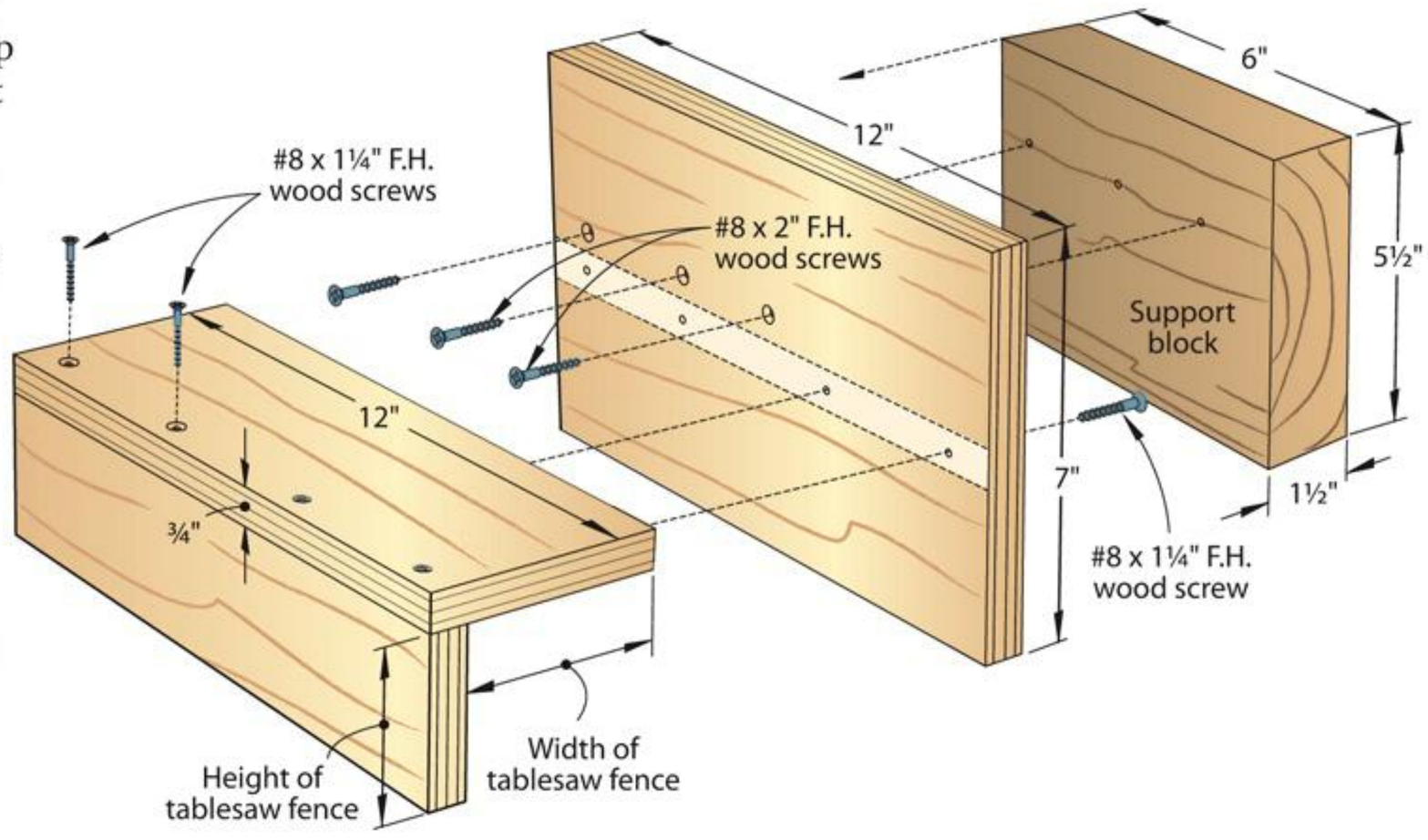
Rip-Fence Tenoning Jig

Rather than paying $50 to $100 for a factory-made tenoning jig, make this one from scrap stock and get equally great results. We used it to cut perfect tenons when building the side chair on *page 56*. Before using the jig, align your tablesaw's rip fence parallel to the blade to prevent pinched cuts and inaccurate tenons.

Start by cutting the three jig-body parts to size from ¾"-thick plywood. Glue and screw the jig together as shown *below right*.

Note: *To ensure the jig slides easily on the fence, slip a sheet of 220-grit sandpaper between one of the vertical parts and the fence face for spacing during assembly.*

Next, cut the support block as shown from any scrap stock you have on hand, even a piece of 2×6 pine. With the jig body resting on the locked-in-place rip fence, screw—don't glue—the support block to the tall jig face. (This allows you to replace the support block after repeated cuts have chewed it up.) Finally, ease the sharp edges and ends on all parts with a sanding block.



Find more Quick & Easy Jig plans at:
woodmagazine.com/freeplans

This face launched 1,000 projects.

JEFF BAENEN is a mechanical designer and the grand prize-winner of The Woodworking Shows' First Annual ShowOFF Showcase with his project "My Nightmares and Dreams," an amazing box – see it at TheWoodworkingShows.com. Jeff makes intricate boxes that are both useful and incredible works of art.

Favorite Tool: Toss-up between the table saw and the router table and -it may sound corny - but the other favorite tool that I use more than everything, is the pencil. I love sketching out new ideas...and who doesn't always need a pencil, within arms reach, while in the shop.

Best Project: That is a tough one. I fall in love all over again every time I start a new box. My favorite one, on the engineering side of my brain, would be "Box of Chocolates." It has three wooden lifting mechanisms within it. Artistic side would be "My Nightmares and Dreams" or my newest box "Ripple". In the end my favorite project will always be a new box!

Working On: I recently got back from a business trip to Japan and while I was there I hunted down a woodworking store. I bought a Japanese Bamboo Froe and a block of wood to build a display box for it. Other than that I promised a pencil box to my budding artist niece...and I just happen to be in need of one also.

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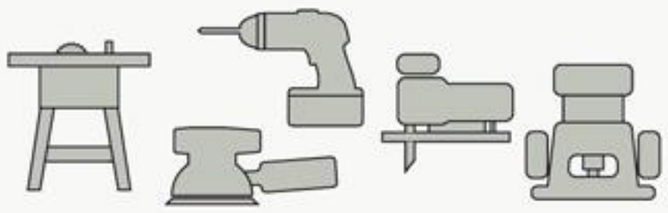
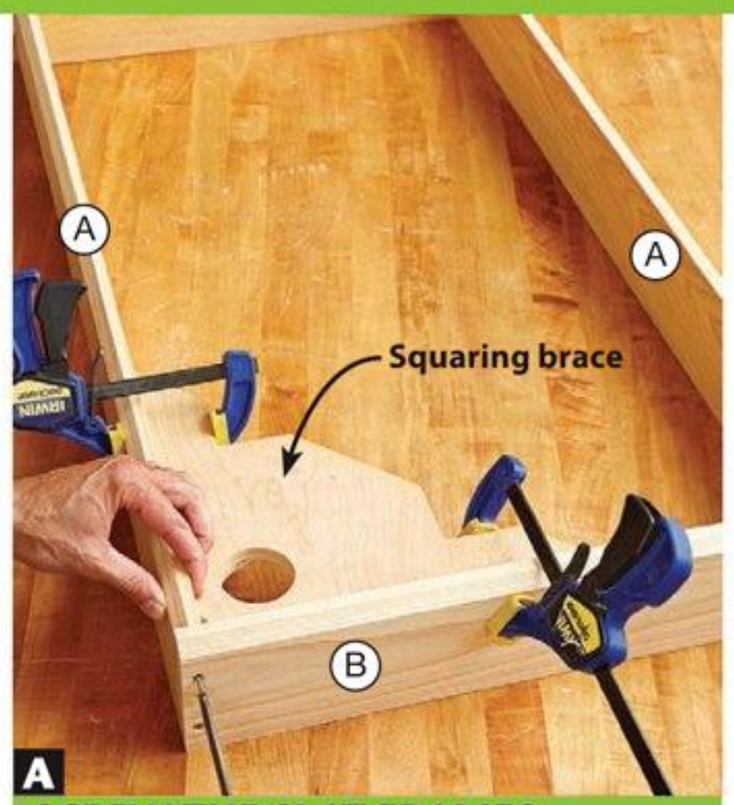


- **Materials:** ¾" cypress, ¾" copper pipe.

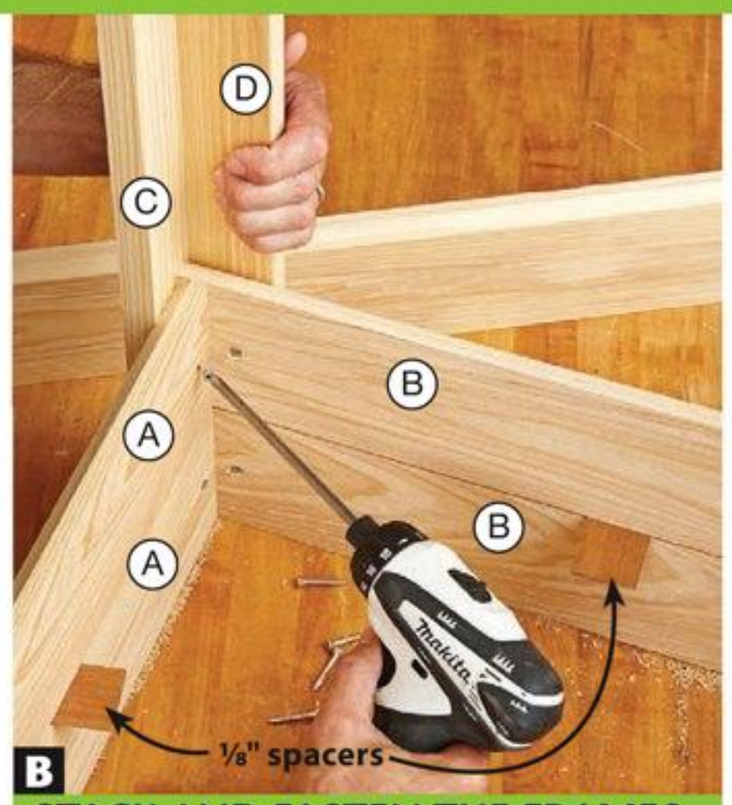
PROJECT HIGHLIGHTS

- Cypress and copper pipes endure all types of weather.
- Materials cost: cypress, $120; copper pipe, $50.



SCREW THE SLAT FRAMES

Clamp the front/back slats (A) between the side slats (B), drill two countersunk pilot holes at each joint, then assemble the frames.



STACK AND FASTEN THE FRAMES

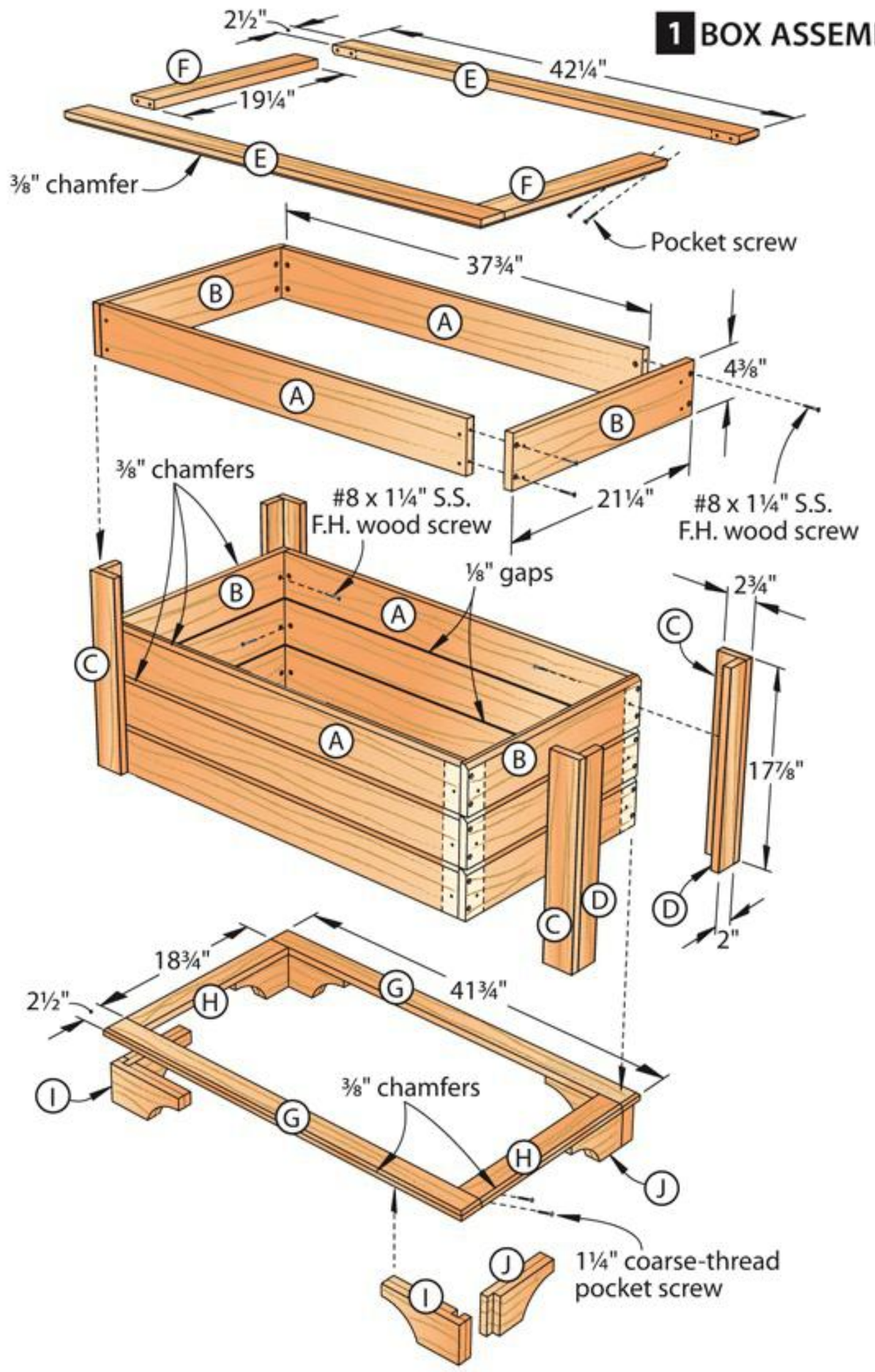
Drive screws from inside the slat frames (A/B) into the corner assemblies (C/D). The unchamfered frame goes on top of the box.

Plant this box wherever you'd like a splash of greenery, and perhaps some added privacy. An open grid inside the box supports plant containers while allowing water, leaves, and dirt to fall through. Build just the box (*inset*), or add the wood-and-copper-water-pipe trellis to support vines. We built ours from cypress [**Source**, *page 34*], but cedar or redwood, or fir with a coat of paint will also stand up to the elements.

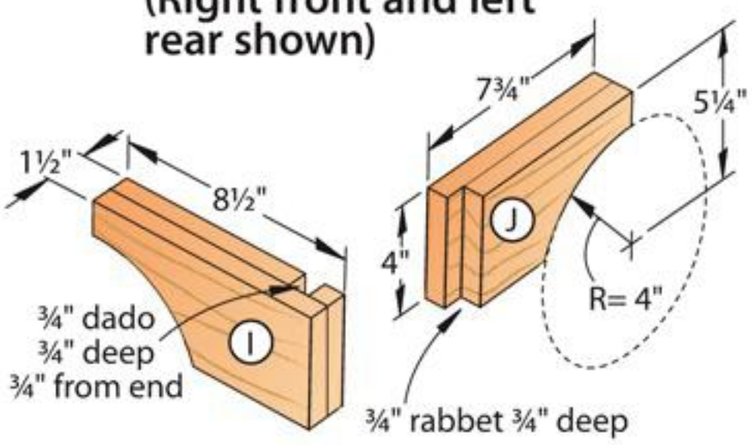
Stack slats to build a box

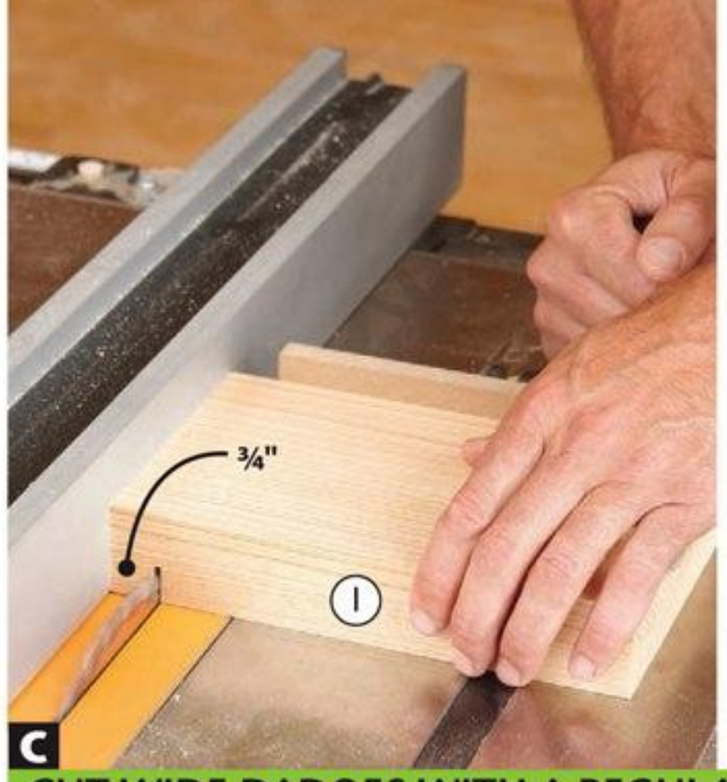
1 Machine the box front, back (A), and side (B) slats to size [**Materials List**, *page 34*]. Rout a ⅜" chamfer on the top outside edge of six front and back slats and six side slats [**Drawing 1**]. Use a squaring brace [**More Resources**, *page 34*] to help assemble four slat frames [**Photo A**]: three with chamfered edges and one unchamfered.

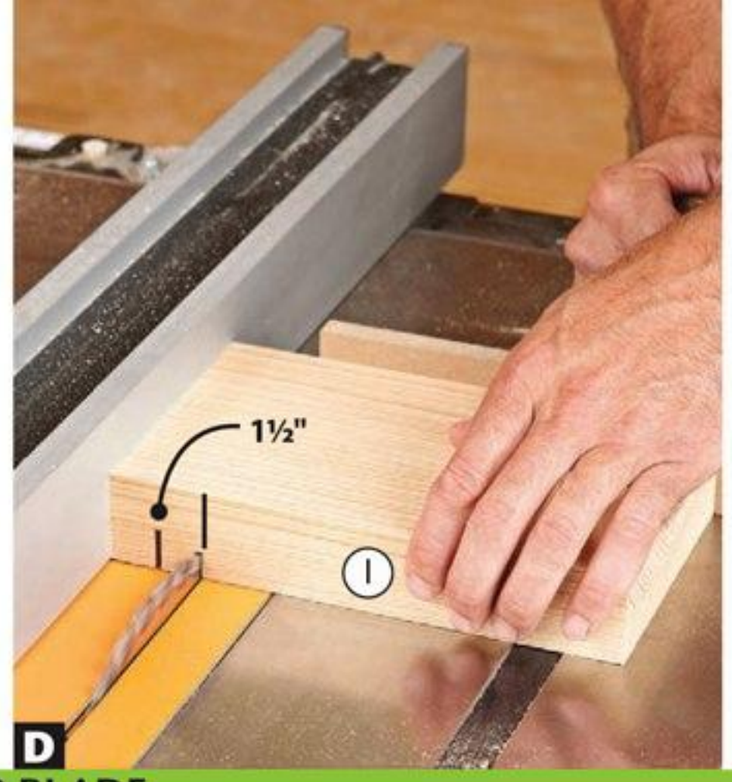
1 BOX ASSEMBLY

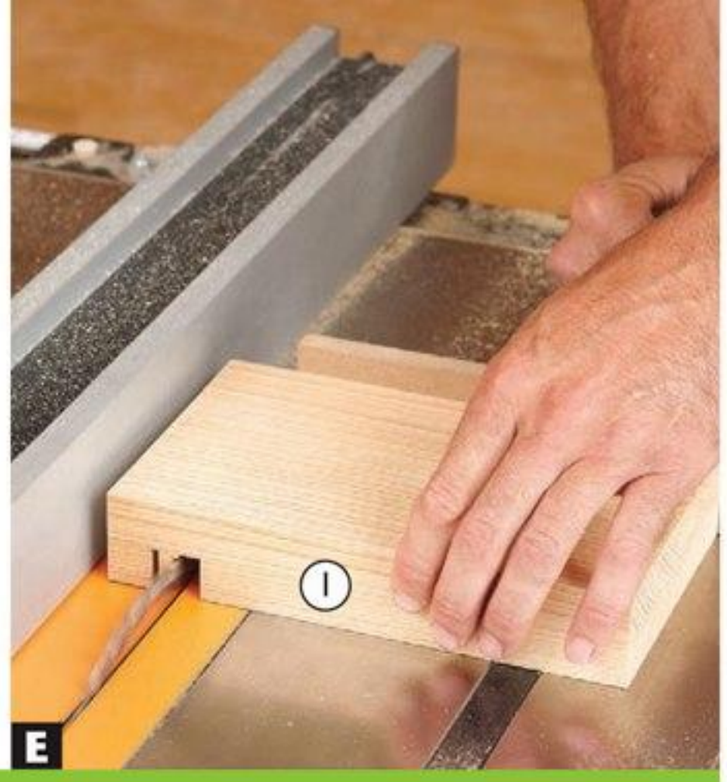


1a FOOT DETAIL (Right front and left rear shown)







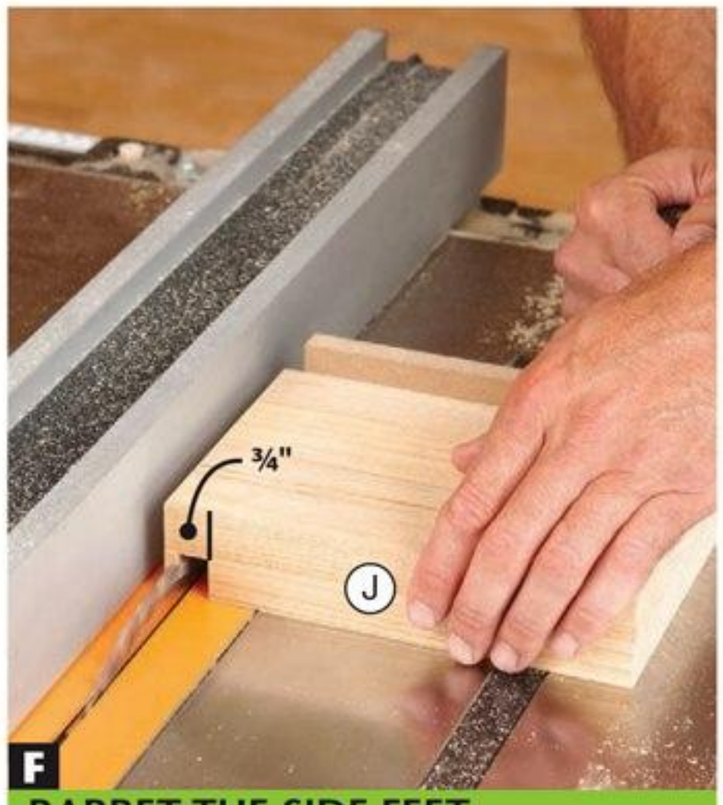


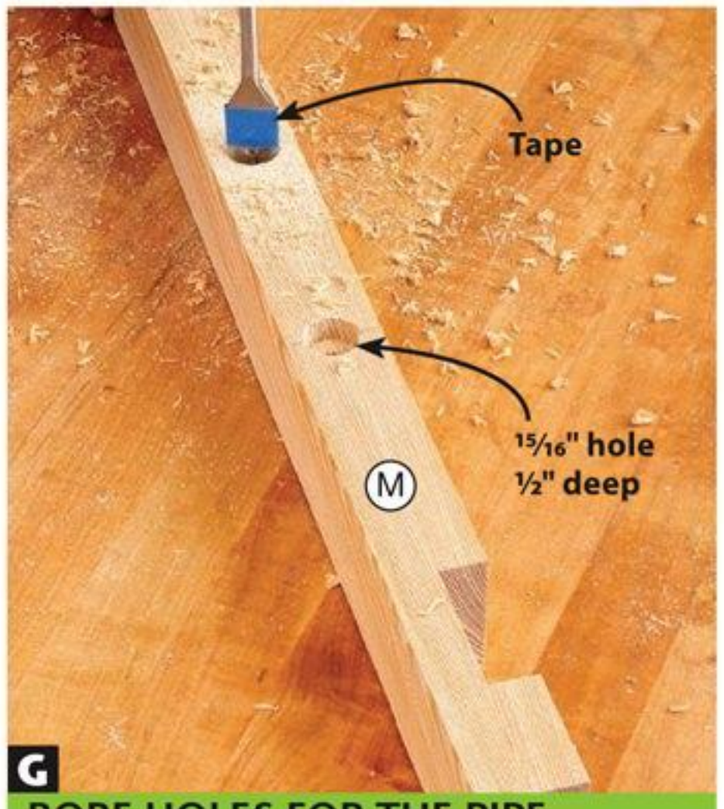
CUT WIDE DADOES WITH A REGULAR BLADE

Set the blade ¾" above the table and the rip fence ¾" from the blade. Make a pass across one end of each front and back foot (I).

Reset the fence 1½" from the *outside* of the blade and make a second kerf in each front and back foot.

Slide the workpiece away from the fence one blade width at a time and nibble away the waste between the kerfs.





RABBET THE SIDE FEET

Cut a rabbet in each side foot (J), leaving a tongue that fits the dado in the front and back feet (I).

BORE HOLES FOR THE PIPE

To mark the hole depth, wrap tape around a 15⁄16" spade bit ½" above the cutters. Drill the holes on the marks.

LAY OUT HOLES FOR THE TRELLIS

Draw lines across all five trellis dividers (O), then lay out the intersecting centerline along each piece to find the hole centerpoints.

2 Cut the front/back corner trim (C) and side corner trim (D) to size. ***Quick Tip!*** Stack the four slat frames (A/B) with ⅛" spacers between them to determine the exact length of the trim pieces. Glue and screw a front/back corner trim and a side corner trim together to make four corner assemblies [**Drawing 1**]. Finish-sand the slat frames and corner assemblies to 150 grit.

3 Starting with a chamfered slat frame (A/B), screw the slat frames to the corner assemblies (C/D). Use the ⅛" spacers again to space the frames [**Photo B**].

4 Cut the top- and bottom-frame rails (E, F, G, H) to size [**Drawing 1**]. Assemble the top and bottom frames with pocket screws, then rout a ⅜" chamfer along the bottom outside edge of the top frame (E/F) and the top outside edge of the bottom frame (G/H). Finish-sand the frames to 150 grit.

5 With the chamfered face of the bottom frame (G/H) facing up, use a water-resistant wood glue (Type II or III PVA or polyurethane) to glue the box (A–D) to the bottom frame, centered. Then center and glue the top frame (E/F) to the top of this assembly with the chamfers facing down [**Drawing 1**].

6 From 1½"-thick stock (we laminated ¾" boards), cut the front and back feet (I) and side feet (J) to size [**Drawing 1a**]. Cut ¾×¾" dadoes in the front and back feet as shown in **Photos C, D,** and **E.** Reset the rip fence ¾" from the *outside* of the blade and cut a rabbet in each side foot [**Photo F**].

7 Lay out the arch on each front, back (I), and side (J) foot [**Drawing 1a**]; then jigsaw just outside the line, and sand up to the line. ***Note:*** *Make two rights and two lefts of each part.* Glue and clamp a front or back foot to each side foot. After the glue dries, sand the feet to 150 grit, then glue the feet to the bottom frame, centered on the width of the frame rails (G, H).

8 Cut the drip-frame ends (K) and slats (L) to size [**Drawing 2**] and screw the drip frame together. Place the drip frame in the box. If you don't want to build the trellis, apply an exterior finish to complete the box.

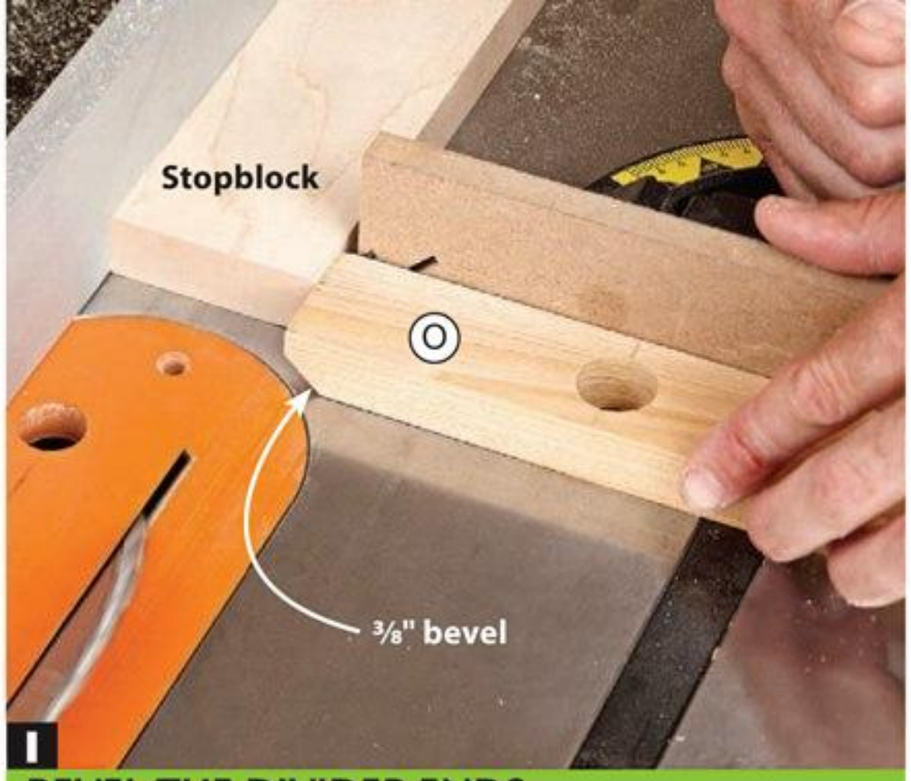
Quick Tip! Choose a finish with outdoor life. We applied a clear finish to show the project's grain, but a heavily pigmented stain will better endure sun and weather.

Try the trellis

1 From laminated ¾" stock cut the trellis uprights (M) and rails (N) to size [**Drawing 2**]. Lay out the dadoes on the uprights and the rabbets on the rails. Using the same method used on the feet (I, J), cut the joints.

2 On the uprights (M), lay out locations for the holes that hold the pipe [**Drawing 2**], then drill them [**Photo G**].

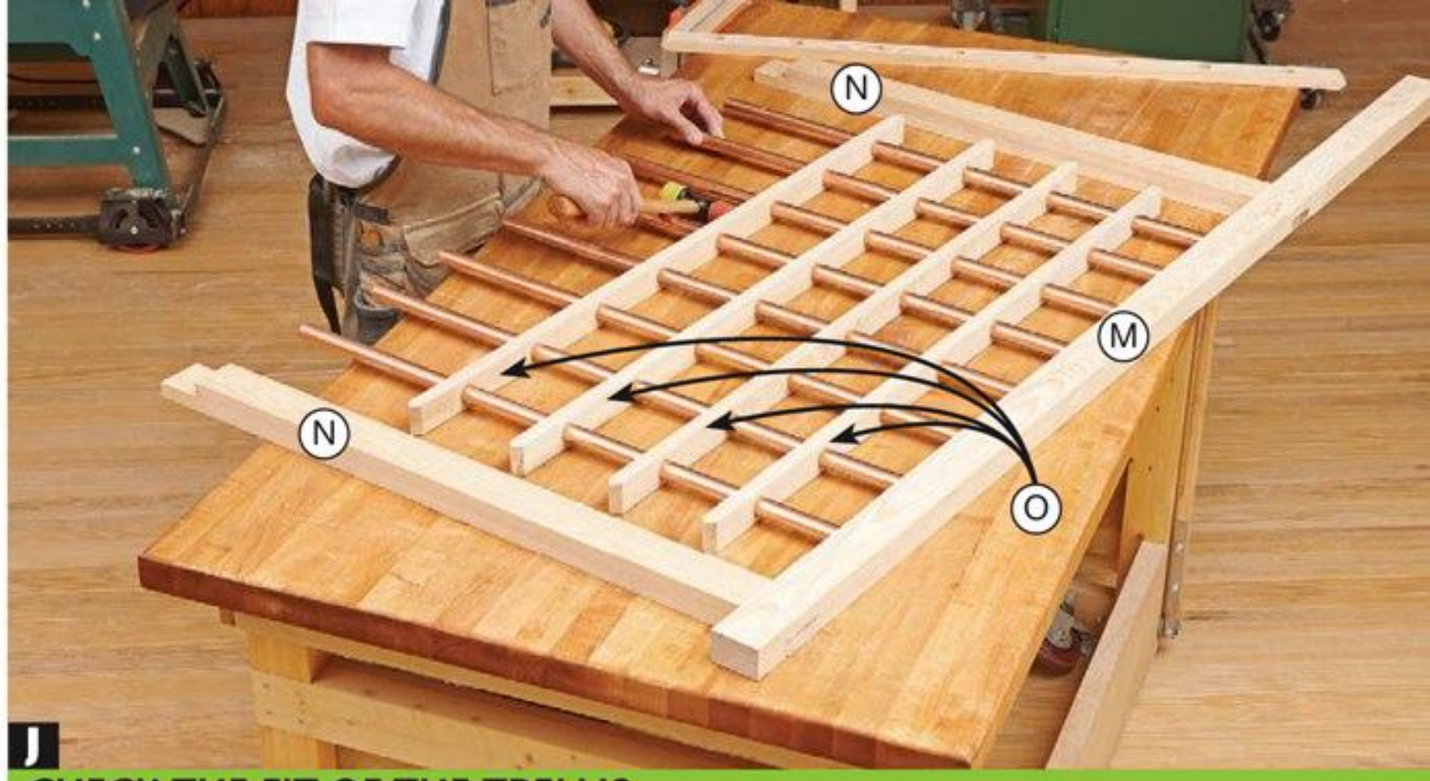
3 Cut the trellis dividers (O) to size. Set them side by side on your bench



I

BEVEL THE DIVIDER ENDS

Set a stopblock to bevel half the divider's thickness. The stopblock also creates room for the waste to fall away.

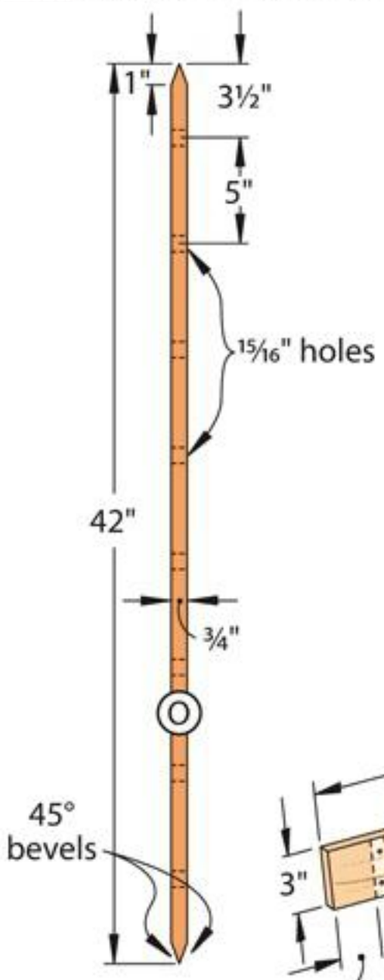


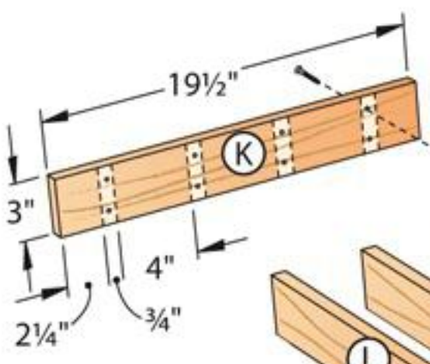
J

CHECK THE FIT OF THE TRELLIS

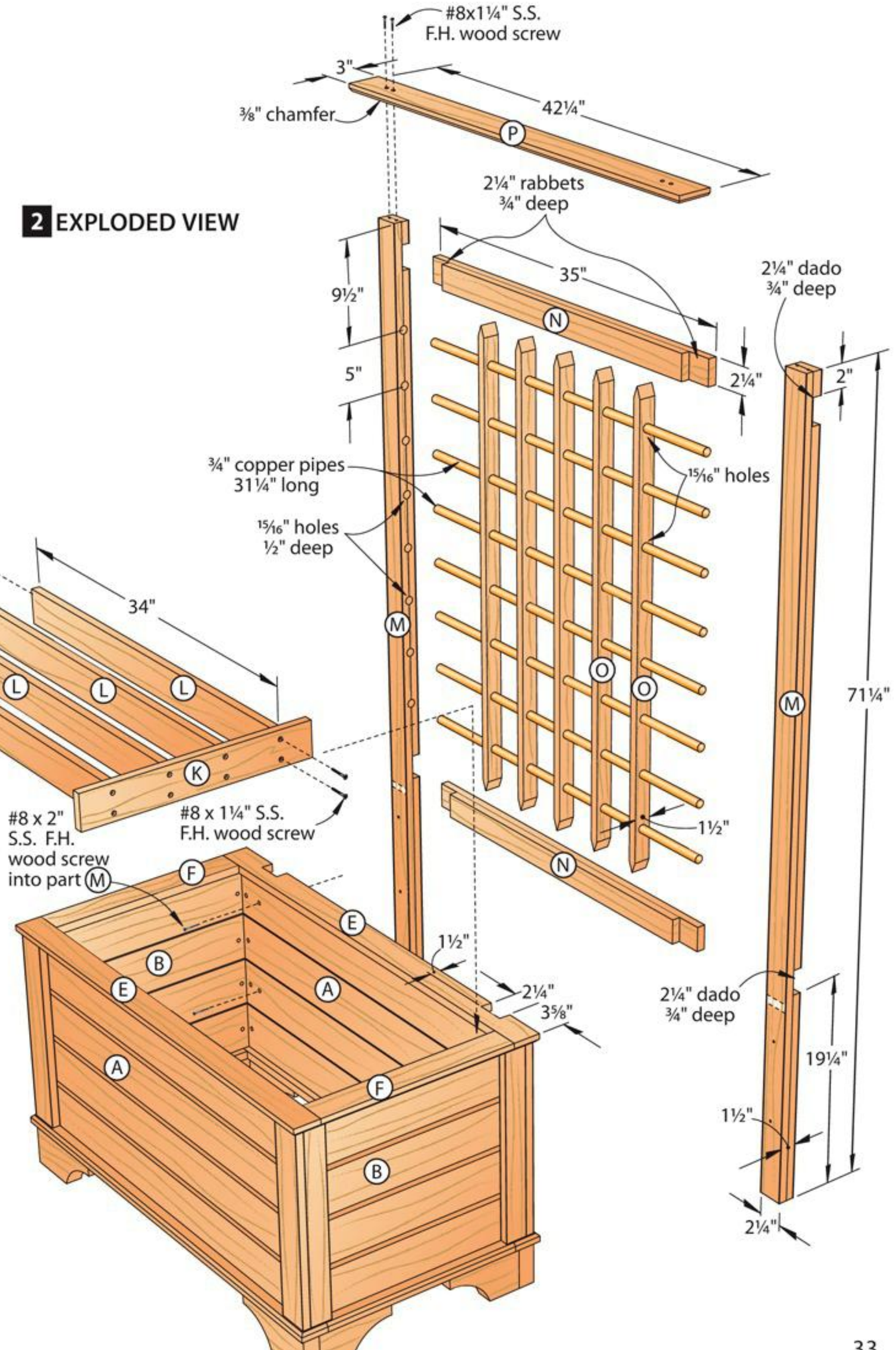
Slide the dividers (O) onto the copper pipes, and check that the assembly fits inside the dry-fit trellis (M/N).

2a TRELLIS DIVIDER DETAIL





2 EXPLODED VIEW



with their ends flush and lay out the hole locations [**Photo H, Drawing 2a**]. To prevent chip-out when the bit exits the hole, set the divider on top of a piece of scrap, then drill the holes.

4 Tilt your tablesaw blade to 45° and install a zero-clearance insert. Clamp a stopblock to the rip fence in front of the blade and, making test cuts on scrap the same thickness as the trellis dividers (O), adjust the rip-fence position to cut ⅜" bevels [**Photo I**]. Bevel the ends of the dividers.

5 With a hacksaw or pipe cutter, cut eight 31¼"-long pieces of ¾" copper pipe. Remove lettering and stickers from the pipe using a cloth dampened with lacquer thinner.

6 Glue and clamp one end of each trellis rail (N) to a trellis upright (M). Dry-fit the pipes and trellis dividers (O) [**Photo J**] and clamp this assembly between the trellis uprights to check the fit. Remove the dividers and pipes and once again dry-fit the loose upright to the rails. Center the uprights/rails assembly on the back of the box (A–L) and mark locations for notches to accept the uprights. Cut the notches with a handsaw or coping saw.

7 Cut the trellis top (P) to size and rout a ⅜" chamfer around one face [**Drawing 2**]. Disassemble the trellis and set the pipes aside. Sand the trellis parts to 150 grit. Tape off the unglued half-lap joints on the trellis upright (M) and rails (N) and apply a finish to the uprights, rails, dividers (O), and trellis top.

8 After the finish dries, remove the tape, reassemble the trellis, and glue the final upright (M) in place. Screw the top (P) in place, centered on the depth and width of the trellis. Fit the trellis in the notches in the top-frame rail (E) and screw the trellis to the rear of the box [**Drawing 2**]. Place containers on the drip frame (K/L) and fill them with plants.

Produced by **Craig Ruegsegger** with **Kevin Boyle**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine; Lorna Johnson**

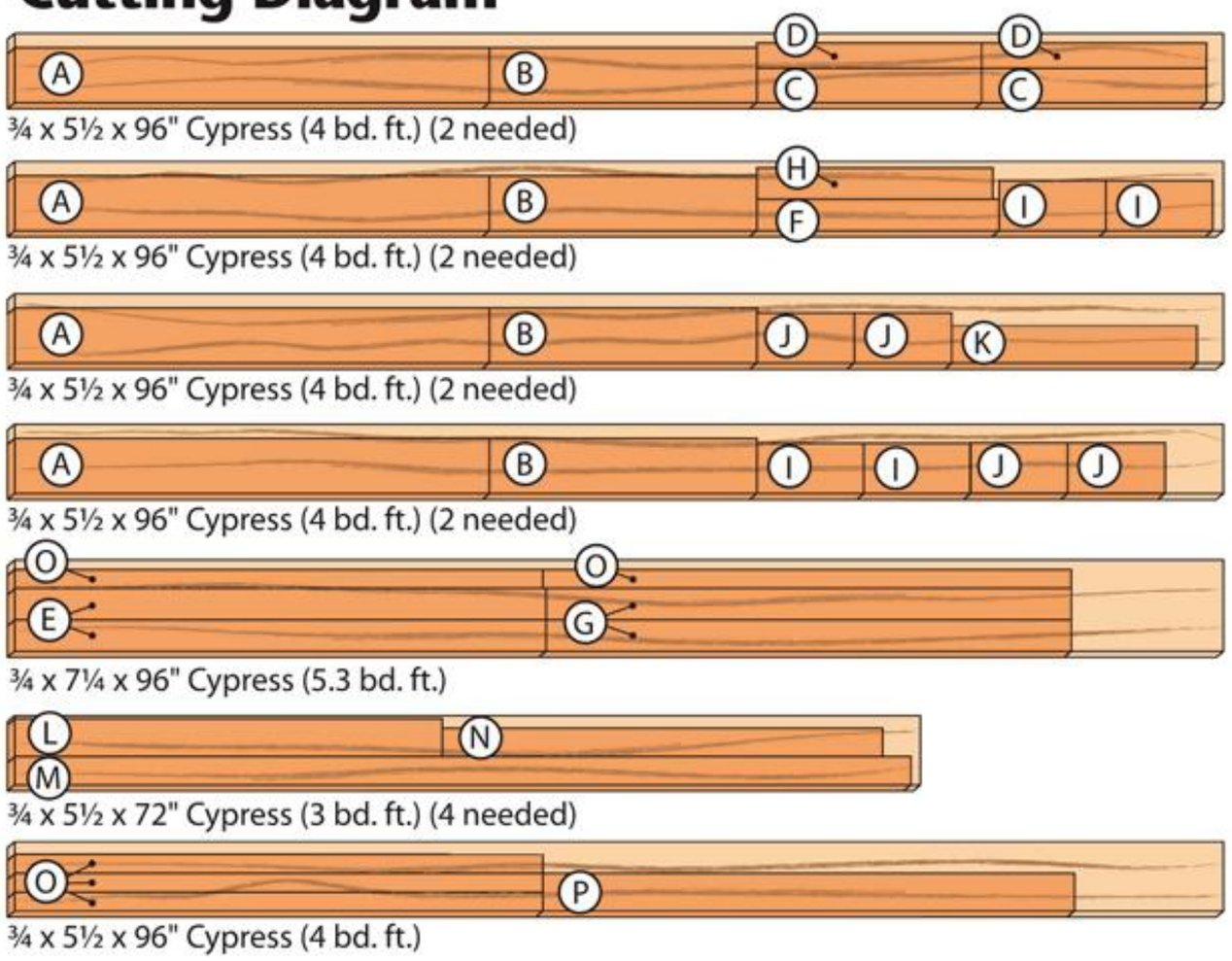
Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Planter box						
A	front/back slats	¾"	4⅜"	37¾"	C	8
B	side slats	¾"	4⅜"	21¼"	C	8
C	front/back corner trim	¾"	2¾"	17⅞"	C	4
D	side corner trim	¾"	2"	17⅞"	C	4
E	top-frame front/back rails	¾"	2½"	42¼"	C	2
F	top-frame side rails	¾"	2½"	19¼"	C	2
G	bottom-frame front/back rails	¾"	2½"	41¾"	C	2
H	bottom-frame side rails	¾"	2½"	18¾"	C	2
I*	front/back feet	1½"	4"	8½"	C	4
J*	side feet	1½"	4"	7¾"	C	4
K	drip-frame ends	¾"	3"	19½"	C	2
L	drip-frame slats	¾"	3"	34"	C	4
Trellis						
M*	trellis uprights	1½"	2¼"	71¼"	C	2
N*	trellis rails	1½"	2¼"	35"	C	2
O	trellis dividers	¾"	1½"	42"	C	5
P	trellis top	¾"	3"	42¼"	C	1

*Parts laminated from ¾"-thick stock.

Material key: C–cypress.
Supplies: #8×1¼", #8×2" stainless steel F.H. wood screws (or 1¼" and 2" deck screws); 1¼" coarse-thread pocket screws; ¾" copper pipe (3 10' lengths).
Bits: 45° chamfer router bit; 15/16" spade bit.

Cutting Diagram



Source

Cypress lumber: Wilson Lumber Co., 1279 N. McLean Blvd., P.O. Box 820526, Memphis, TN 38182-0526, 901-274-6887, cypressusa.com. For a list of other cypress suppliers, go to the Southern Cypress Manufacturers Assn., cypressinfo.org.

MORE RESOURCES

FREE PLAN AND ARTICLE

- Build a squaring brace using the plan at woodmagazine.com/brace
- Learn more about bald cypress at: woodmagazine.com/cypress

FREE VIDEO AND GALLERY

- Watch how to mill lumber straight, flat, and square at woodmagazine.com/stockprepvid
- Visit our gallery of reader-submitted outdoor-project photos at woodmagazine.com/outdoorgallery

MORE OUTDOOR PLANS

- Find more great plans for your yard and garden at woodmagazine.com/outdoor $

($=Download these plans for a small fee.)

Planting possibilities

The planters shown here were filled by the manager of the Better Homes and Gardens Test Garden® using plants readily available at most independent garden centers or big-box stores.

1. Clematis "Sweet Autumn"
2. Duranta "Gold Edge"
3. Coleus "Kingswood Torch"
4. Thyme "Lemon"
5. Calibrachoa "Trailing Plum"
6. Canna "Burning Ember"
7. Coleus "Dark Star"
8. Pennisetum "Princess Molly"
9. Sweet potato vine "Black Heart"

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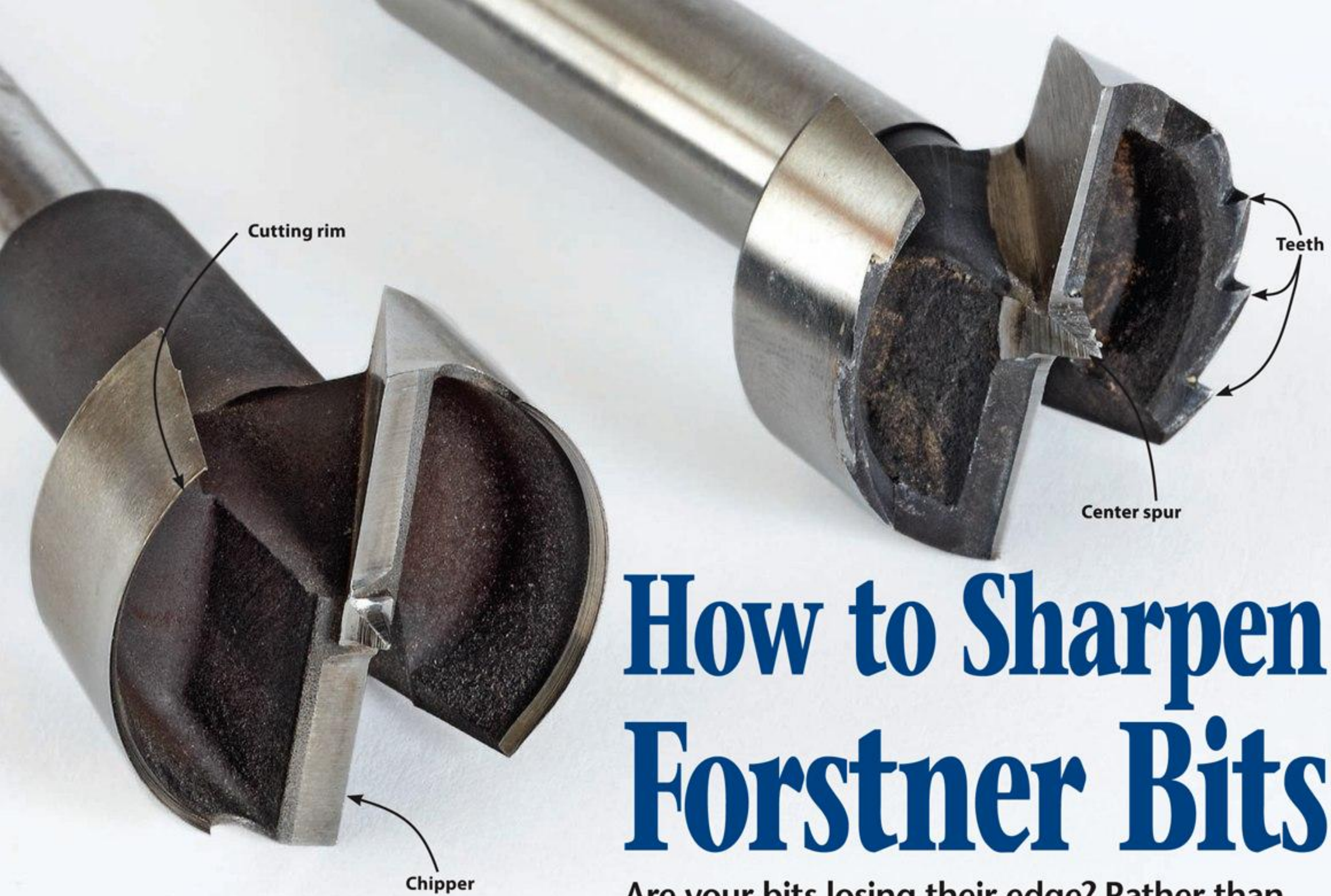


How to Sharpen Forstner Bits

Are your bits losing their edge? Rather than giving them the heave-ho, try the ol' re-hone.

To see a free video of this technique in action, visit woodmagazine.com/forstner.

If those formerly cut-smooth-as-butter Forstner bits now take excessive force to push through wood, and produce more curls of smoke than wood, don't toss them. For about the price of a single premium replacement bit, you can assemble a kit of files and slipstones that will help you get Forstners back in ship-shape boring form in a matter of minutes. The kit consists of a ¼" round fine-grit abrasive file, a ¼" triangular fine-grit abrasive file, and a 3-piece flat mini-hone set. (See **Sources**.)

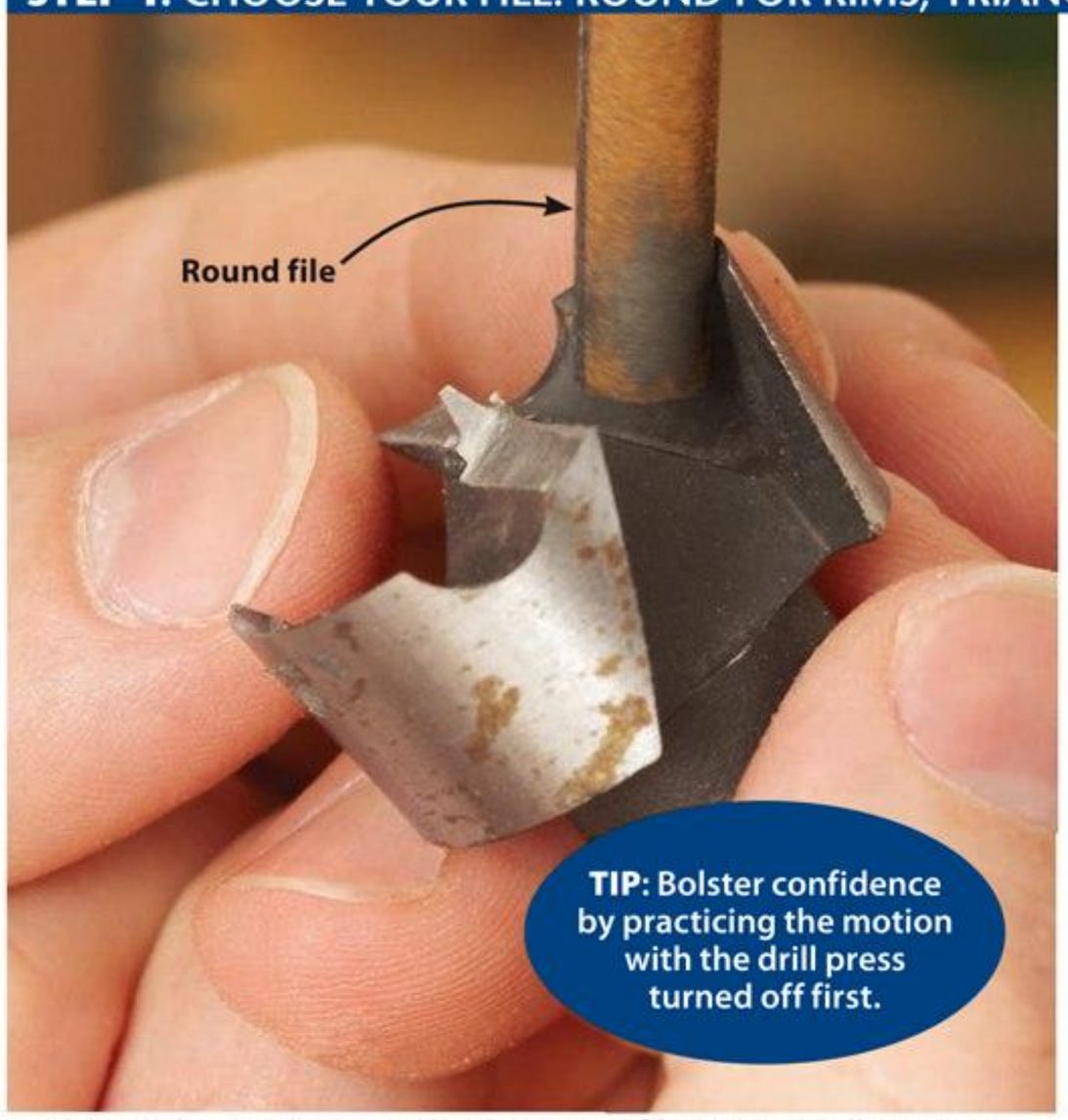
Start by cleaning off any pitch or resin buildup on the bits using blade and bit cleaner (such as Boeshield, item no. 128479, woodcraft.com). Then follow the steps, on the *next page* to restore cutting edges. Remember: Never file the *outside* of the cutting rim because doing that will change the bit's diameter.

DON'T TRY THIS AT HOME

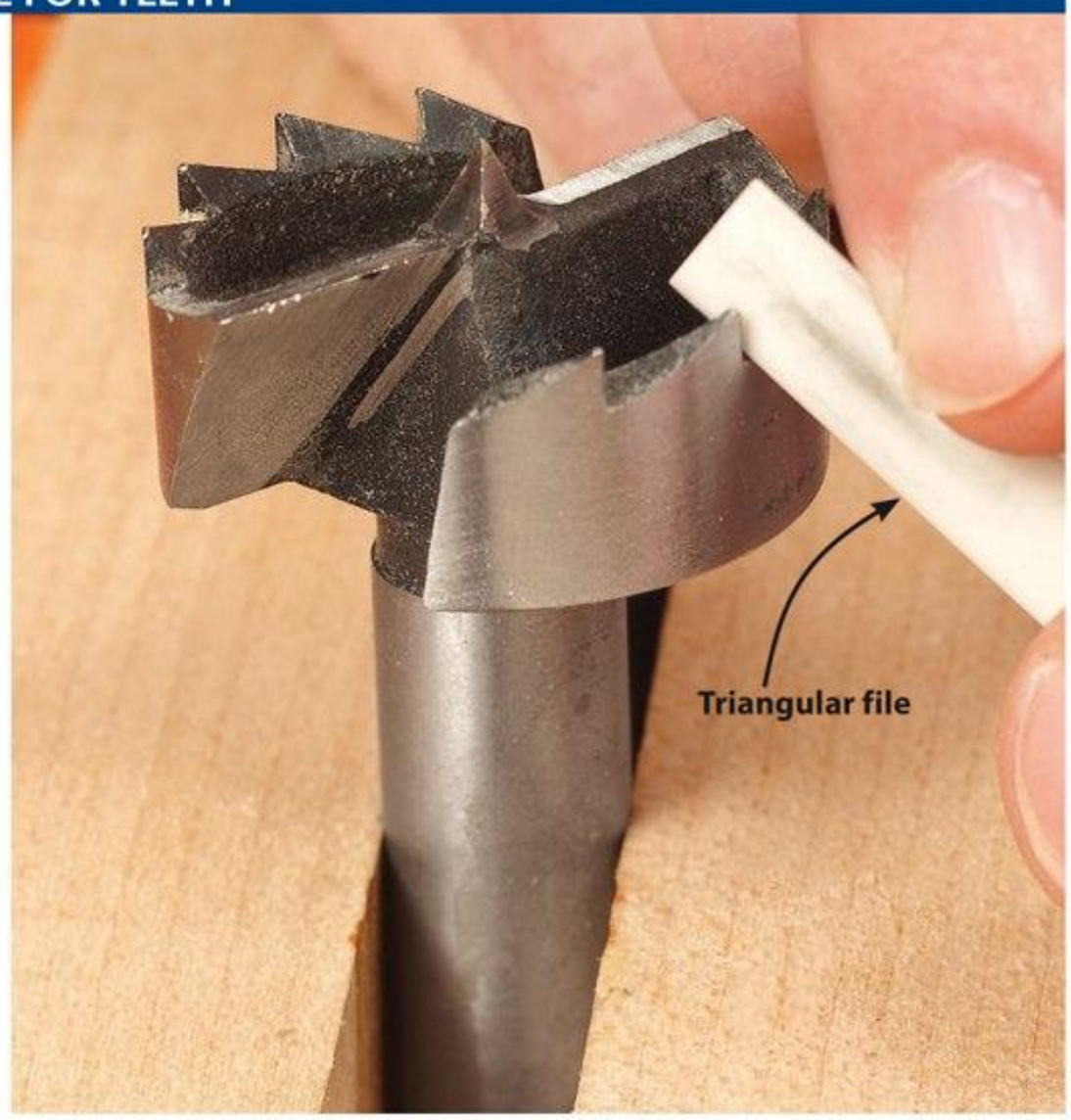
You'd never bore through sandpaper as we did to quickly dull the bits for this article, but some woods, such as cedar, contain silicates that have a similar, albeit slower, dulling effect.

3 Steps to Sharp Forstner Bits

STEP 1: CHOOSE YOUR FILE: ROUND FOR RIMS, TRIANGLE FOR TEETH



For bits with a cutting rim, chuck a round file in your drill press. At the drill's lowest speed, lightly hone the interior of the rim taking care to match the angle of the interior of the rim to the file as you turn the bit through a few quick strokes.

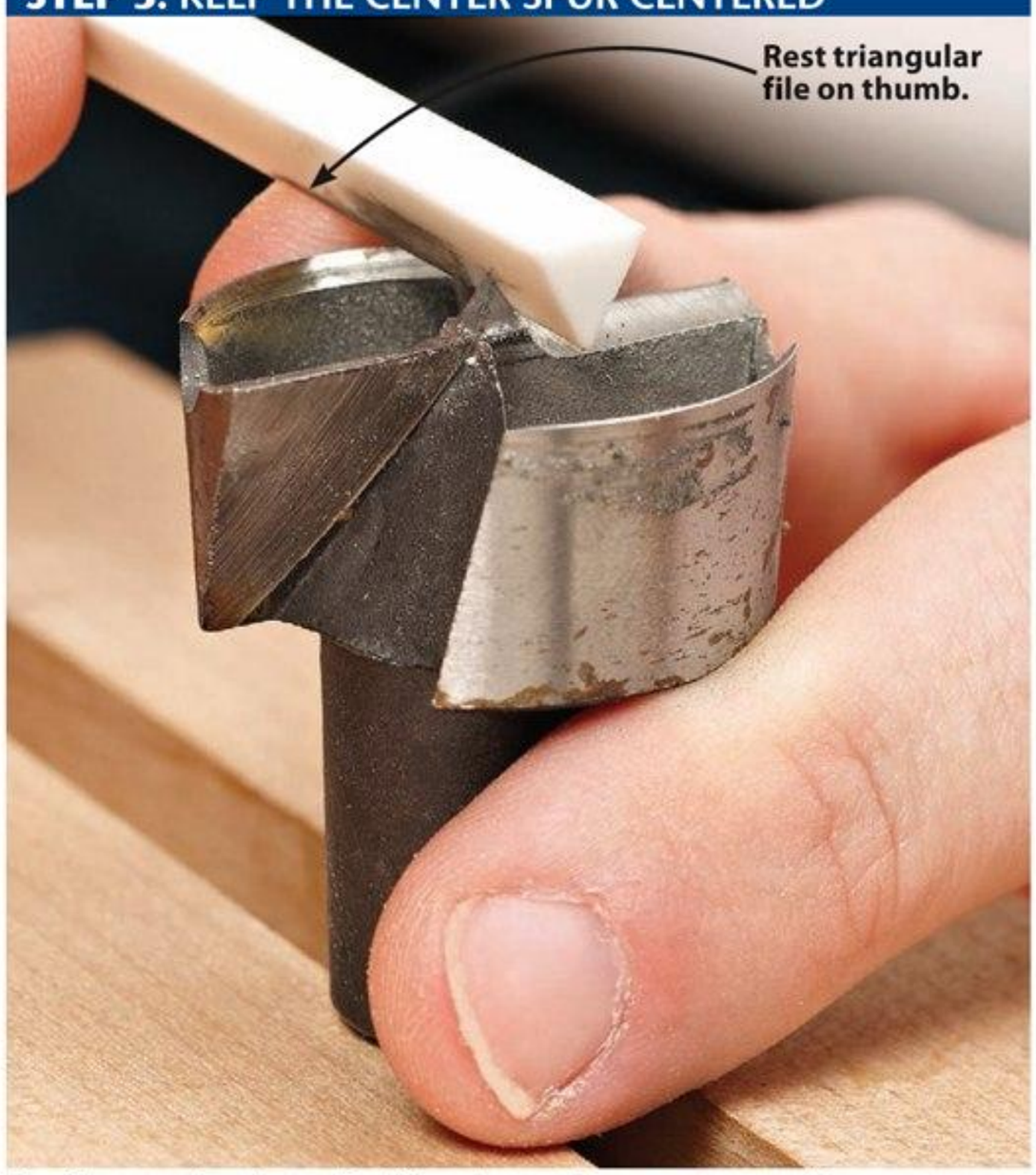


If your Forstner bits have serrated teeth on the cutting rim, skip the round file and instead clamp the bit in a vise and hone the back of each tooth with a triangular file. Don't overdo it; a few strokes per tooth will suffice.

STEP 2: FILE THE FLATS

Next, with the bit clamped in a vise, hone the leading edge of the chippers with a fine mini-hone, ensuring a flat plane and sharp cutting edge. Pay close attention to the intersection where the chipper meets the cutting rim. A crisp corner makes clean cuts.

STEP 3: KEEP THE CENTER SPUR CENTERED



Finally, use the triangular file to hone the center spur. Use your thumb as a guide to protect the chippers and rim. Don't overdo it here: Use the same number of light strokes on each face to keep the point of the spur centered.

Sources: **¼" round file:** McMaster-Carr item no. 4499A11, $10, mcmaster.com, 330-995-5500; **¼" triangular file:** McMaster-Carr item no. 4498A11, $8; **3 piece mini-hone kit:** Woodcraft item no. 147298, $22, woodcraft.com, 800-225-1153.

Sorting out the Cedars

Though five distinct woods share a common name, each has its own personality and use.

To some woodworkers, cedar ranks high as the wood of choice for building decks. Others rely on it for lining closets or cigar humidors. How can one wood be so versatile? It's because multiple varieties exist with different properties and uses. We'll slice through the five most common species so you can choose the cedar that best suits your project.

Western Red Cedar

This member of the cypress family grows from southern Alaska through northern California and in the Rocky Mountains. The trees may grow 200' tall with trunk diameters of 10'.

Western red cedar (*Thuja plicata*) reigns supreme for the production of decking, siding, shingles, and outdoor structures because of its natural decay resistance, ability to repel water, and abundance. Low density and light weight make it easy to cut and shape using hand or power tools. But contact with the sawdust can cause rashes and respiratory problems.

The heartwood of this species bears a consistent reddish-brown tone, sometimes tinged with pink. Knots prove prevalent in lower grades, though "clear" grades are available. Most of its thin white sapwood (which has little decay resistance) gets milled away during lumber processing.

Sources: Find knotty grades in dimensional sizes at home centers and lumber yards; clear grades at hardwood dealers.

Price: $1 to $3 per linear foot in dimensional sizes. $4 to $6 per board foot (clear 4/4 S2S stock).

Northern White Cedar

This cedar (*Thuja occidentalis*) is sometimes called *"arbor vitae"* (tree of life). It grows in southeastern Canada and the northeastern quarter of the U.S., south to Tennessee and west into Iowa. Trees grow 50' tall with 2'-diameter trunks.

Northern white cedar resists decay and insect infestation like its western red cousin, making it similarly suitable for outdoor projects, such as shingles, posts, and decking. Canoe builders use the wood to fashion their boats.

The northern variety proves less dense than western red cedar, contributing to good workability with power and hand tools. The wood tends to be brittle, tearing out without sharp cutters and backer boards. And some woodworkers report rash and respiratory problems.

A thin band of creamy white sapwood surrounds the wood's light brown heartwood, with knots often present.

Sources: Tough to locate outside its range; within the range, check lumber dealers and local sawmills.

Price: $1.75 per board foot (4/4 S2S stock).

Eastern Red (Aromatic) Cedar

This tree (*Juniperus virginiana*) also belongs to the cypress family. It grows throughout the eastern United States, usually to heights of just 20' to 40', though some trees reach 100' or taller.

Most people refer to this wood as "aromatic cedar" because of its pungent natural oils, and use it to line closets and hope chests to ward off insects. Little scientific data exists, however, to show the wood repels bugs effectively.

It works easily with hand and power tools, but use a respirator and gloves if you experience rash and respiratory problems. Nonetheless, pencil makers prefer the wood, as do producers of souvenir wooden novelties.

Eastern red cedar heartwood bears pinkish-red tones with an occasional purplish tinge and deep reddish-brown streaks. The sapwood is almost white, and knots are often present throughout the wood.

Choose polyurethane or lacquer for the best finishing results. In confined spaces, the resins in eastern red cedar can cause finishing problems, as they inhibit proper hardening of oil finishes.

Sources: Seek out hardwood dealers for lumber, home centers for closet lining.

Price: $3.50 per board foot (4/4, S2S stock).

Yellow Cedar

Also known as Alaska cedar, this tree (*Chamaecyparis nootkatensis*) grows in the Pacific Northwest, from Alaska through British Columbia and into Oregon. The wood ranks as hard and dense, with tight rings indicative of its slow growth. Even so the wood remains lightweight, giving it an impressive strength-to-weight ratio.

Native Americans used yellow cedar to produce ultralight, durable canoe paddles and many other useful items. Today, makers of stringed musical instruments prize the wood because of its excellent sound quality. Boatbuilders use it for decks, railings, and interior paneling.

Yellow cedar ranges in color from creamy white to sulfur yellow, with occasional dark streaks. The wood machines beautifully, glues and stains well, and develops a satiny sheen.

Sources: Luthier's supply companies, specialty hardwood dealers.

Price: $6.50 to $7 per board foot (4/4 S2S stock). Prices for instrument-grade wood run much higher.

Spanish Cedar

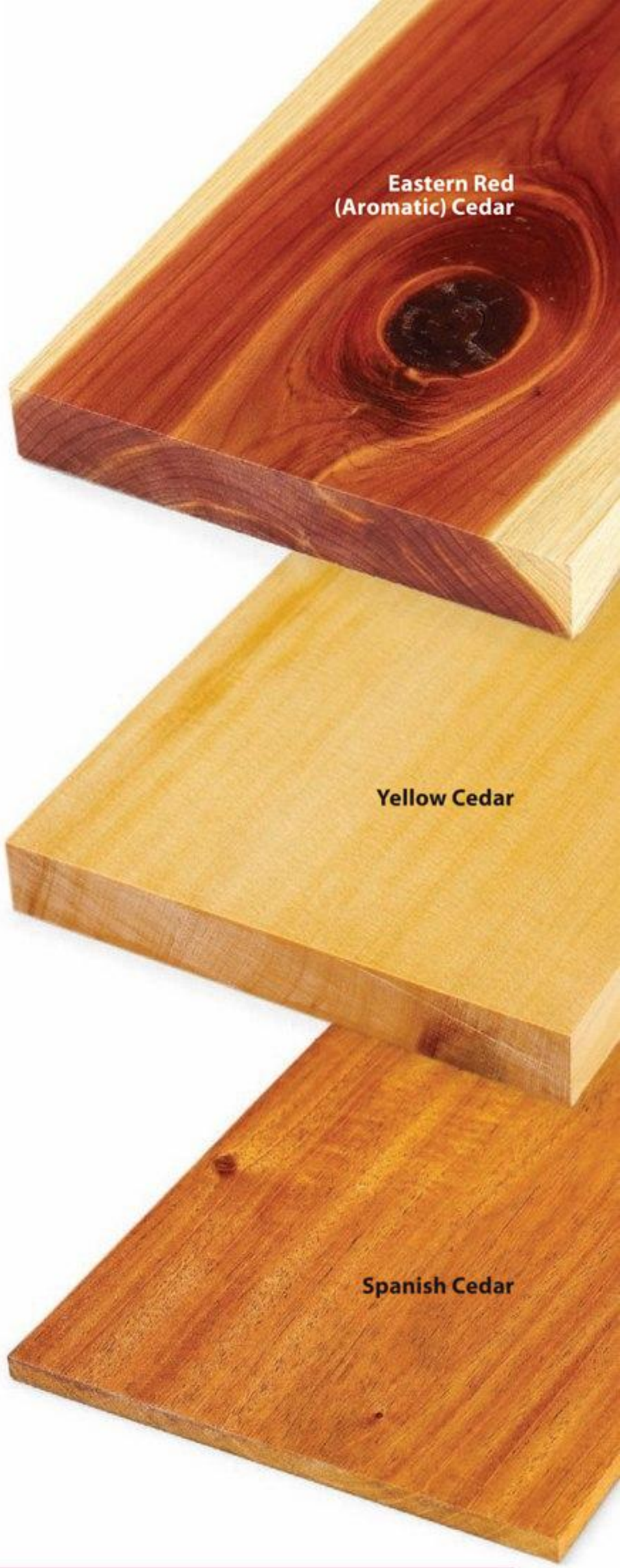
The sole hardwood and only import of this group, Spanish cedar (*Cedrela odorata*) grows natively in Central and South America, and has been planted in Florida. This relative of mahoganies can grow to 100' tall.

Within its range, Spanish cedar gets used for everything from furniture to windows and cabinetry. Builders of lightweight racing boats fashion the wood into sleekly curved hulls. Though harder to obtain in the United States and Europe, Spanish cedar has become the wood of choice for lining cigar humidors because of its aromatic oils and moisture resistance.

The lightweight wood bears straight grain and proves easy to machine and finish. Spanish cedar heartwood has a pinkish to reddish-brown tone that darkens over time.

Sources: Go to hardwood dealers for boards, and woodworking catalogs for small stock.

Price: $7 per board foot (4/4, S2S stock).



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Amp Up Your Bandsaw

Elevate your bandsaw from good to great with these performance-enhancing accessories.

Crank and quick release ease tension adjustments.

Balanced wheel smooths operation.

Beefy blade rips into resawing.

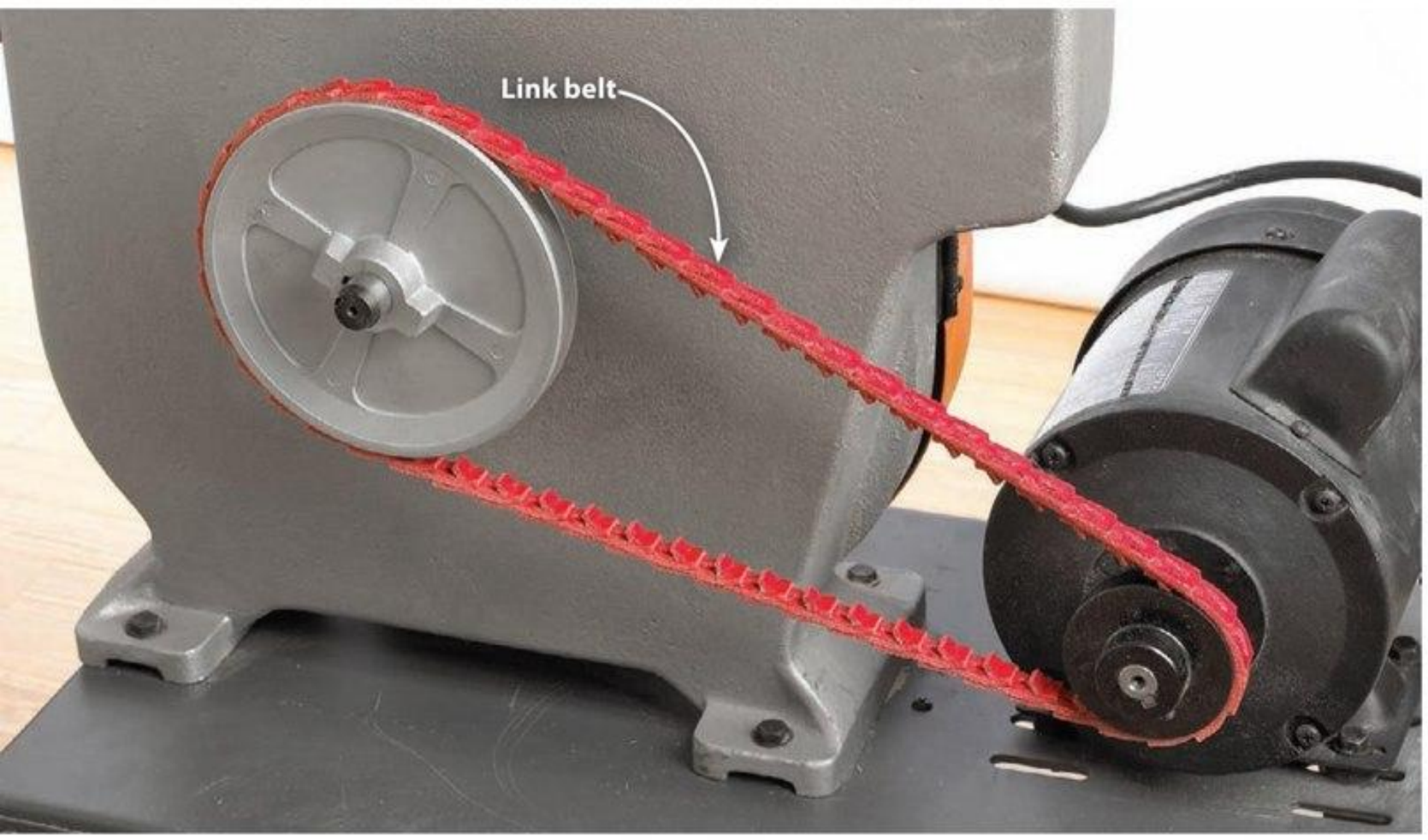
Full-featured fence improves accuracy.

Upgraded guide bearings reduce friction.

The bandsaw may be one of the easiest stationary tools to "amp up" with numerous accessories that improve performance or convenience. Some do both. Not every saw needs all these improvements, but yours will probably benefit from at least a few of these upgrades.

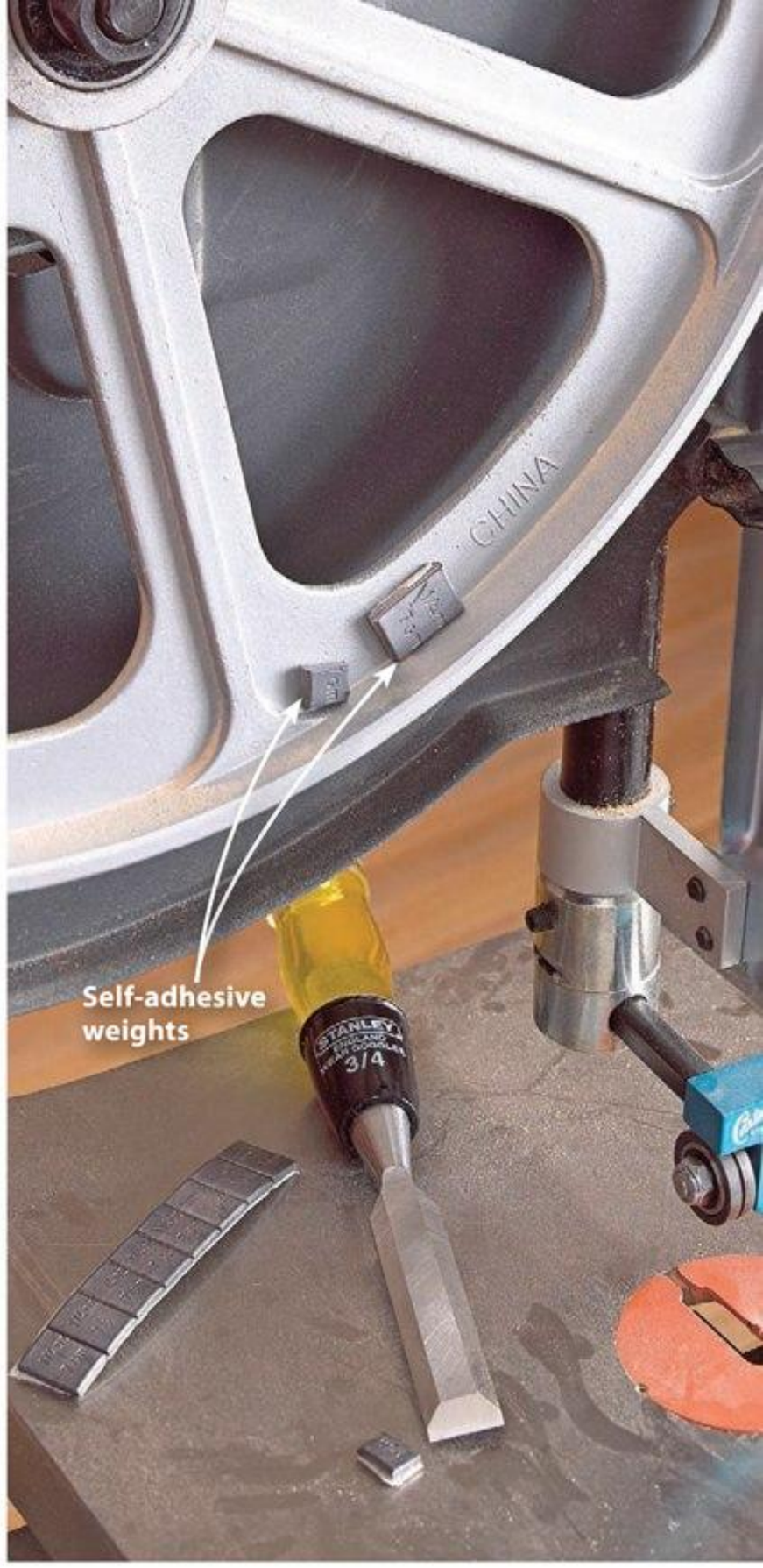
Boost power and performance

All the accessories in the world won't help much if your bandsaw stalls during demanding cuts or shakes like an over-caffeinated chihuahua. Smooth out the tremors and get as much cutting power as possible with these upgrades.



Cinch up your belt ▲

When the V-belt that connects the motor pulley and drive pulley sits in one position too long, it can take on a permanent curve, or "set," where it wraps around the pulleys, causing a nasty vibration. Replace it with a link belt that stays flexible and absorbs vibration better than one-piece V-belts. Buy it by the foot, then adjust its length to fit your saw by adding or removing links. ($9/ft., item 52233, Rockler, 800-279-4441, rockler.com.)



Checks and balances ▲

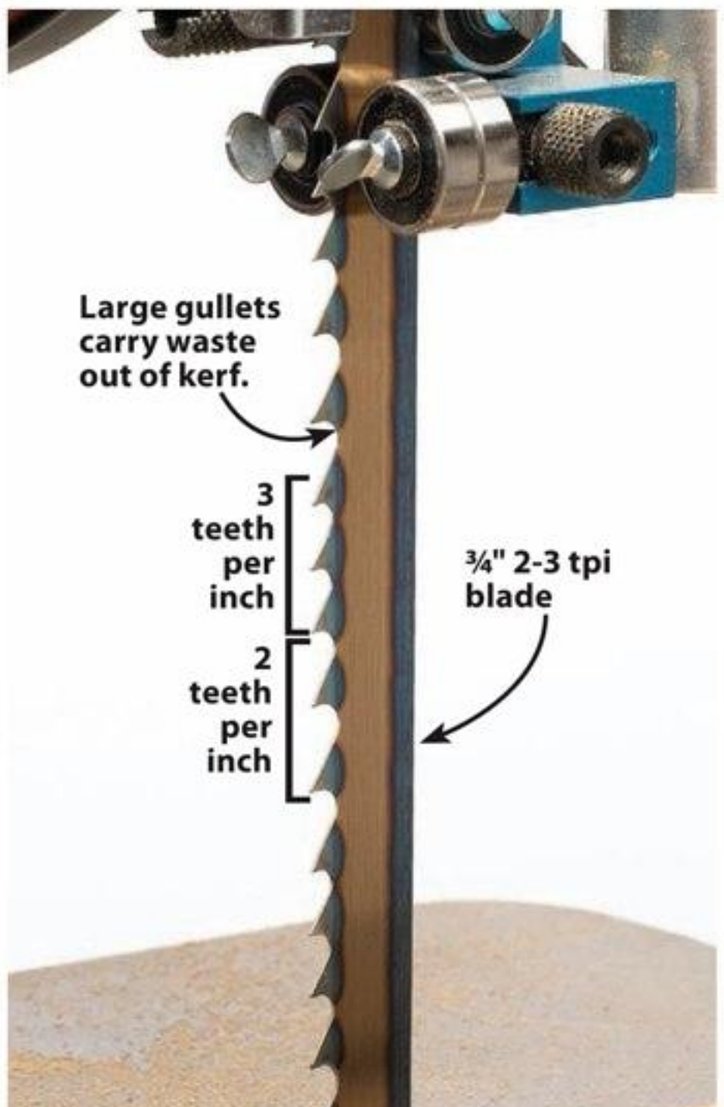
If replacing the belt doesn't calm the jitters, check for out-of-balance wheels. To do this, remove the blade and drive belt so the wheels spin freely. Working on one wheel at a time, make a mark on the inside edge of the rim at its lowest point. Give the wheel a gentle spin, wait for it to stop, and make another mark at the bottom. Do this five times. Randomly-spaced marks mean the wheel is balanced. But a cluster of marks in one area points out a heavy spot and indicates the wheel needs to be balanced.

To do this, clean the wheel rim directly opposite the marks with rubbing alcohol and allow it to dry; then apply self-adhesive wheel weights to the cleaned area, starting with ¼ ounce. Repeat the "spin test," this time making marks with a different-colored marker. Grouped marks again tell you to apply more weight, or change the amount or position of weights already in place. For small adjustments, divide the soft metal weights with an old chisel or knife. (Strip of twelve ¼-oz. weights, $4, Competition Accessories, 800-543-8208, compacc.com.)

Put some teeth into it ▶

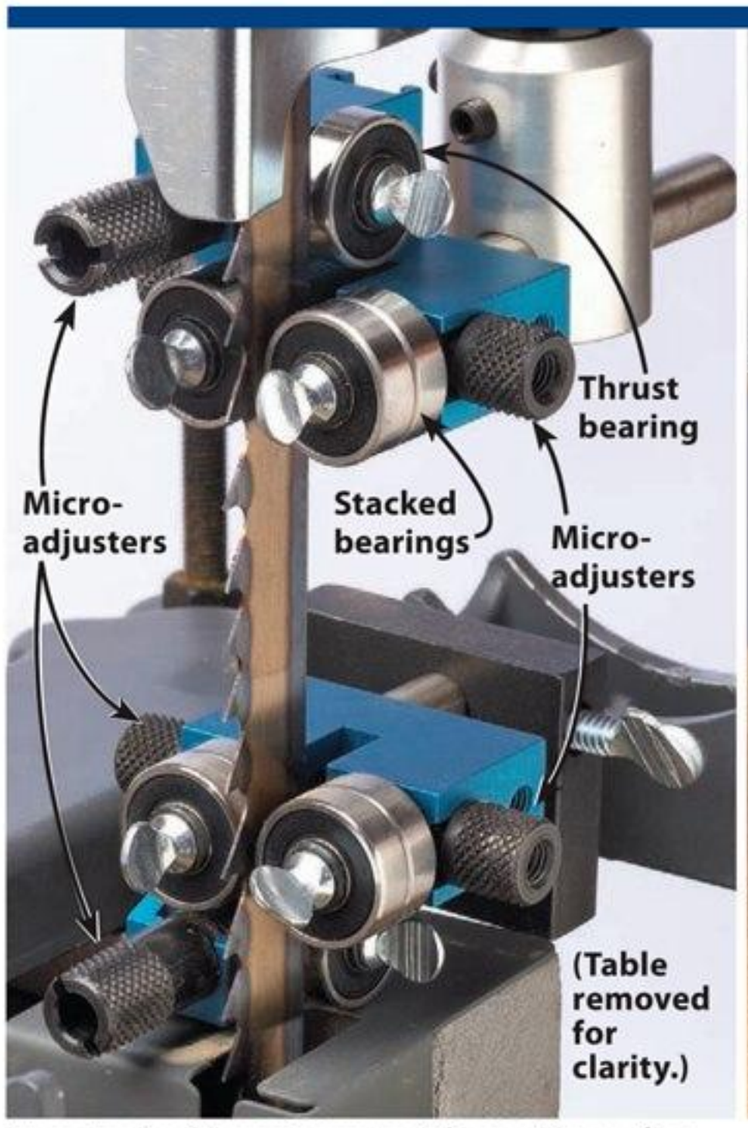
Resawing wide stock requires all the power a bandsaw has to give, so make the most of your saw's efforts by stepping up to the widest 3-tooth-per-inch (tpi) blade your saw accepts. A wider blade flexes less for truer rip cuts and its larger surface area dissipates heat better so the blade stays sharp longer. The aggressive hook angle of the teeth on a resaw blade cuts quickly, generating a lot of sawdust. The large gullets clear that waste faster.

A blade with variable pitch, *right,* alternates sections of 2-tpi and 3-tpi. The 2-tpi sections cut quickly, even through the widest stock your saw handles. The 3 tpi sections reduce vibration, giving a relatively smooth finish. (Timber Wolf ¾x2-3VPC blade or ½x3PC blade, $23.74, Suffolk Machinery, 800-234-7297, suffolkmachinery.com.)



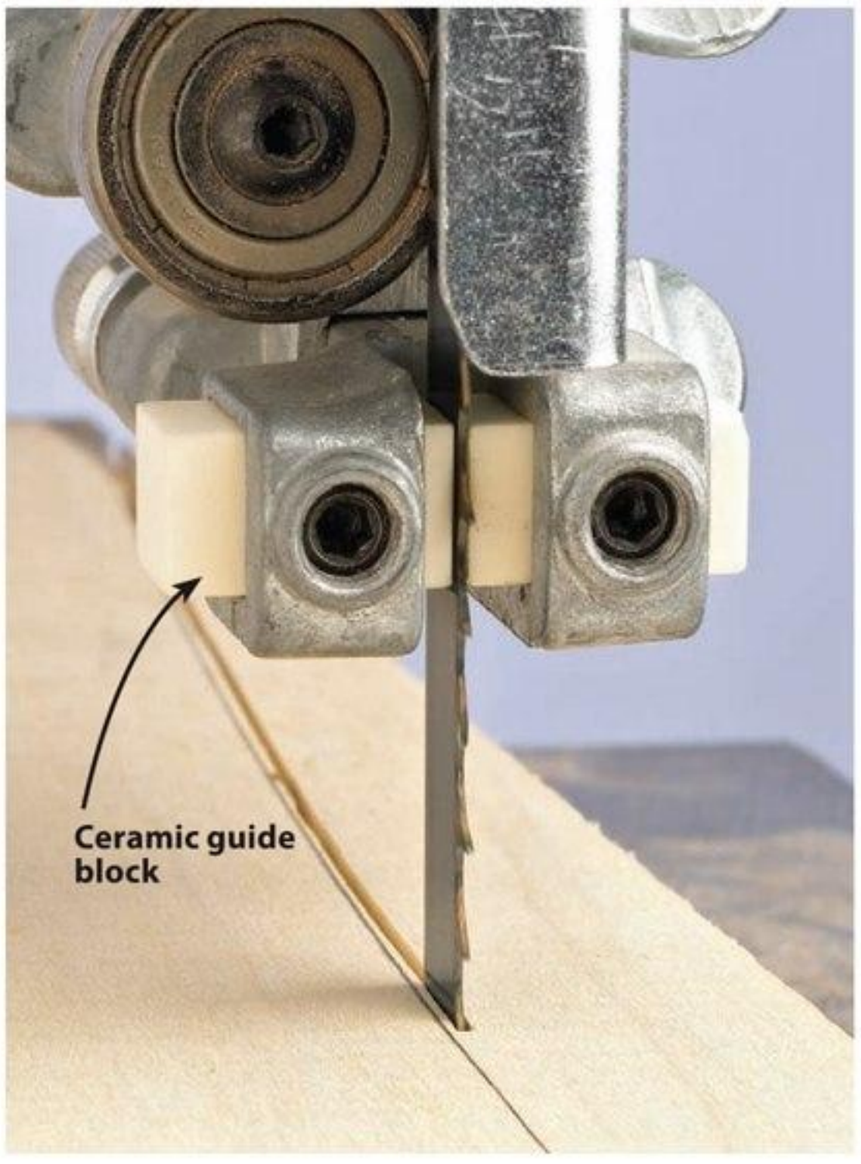
Guidance counseling: Keeping the blade and workpiece on track

Without guide blocks or bearings above and below the table, a bandsaw blade would wander like a four-year-old on her first ride without training wheels. Like that child, bandsaw blades, and sometimes the workpiece, need guidance. Keep them on track with these enhancements.



Two stacked bearings provide a wide surface that prevents blade twist without the friction created by guide blocks.

This single bearing replaces the upper guide assembly when using narrow blades. Nestled into the groove, the blade resists twisting.



Get your bearings ▲

Guide blocks, with their large surface area, work especially well guiding wide blades, while roller bearings create less friction and heat buildup. Stacked roller-bearing guides from Carter Products, *above*, combine the best of blocks and bearings. They also have toolless adjustment: Twist a thumbscrew to loosen a bearing; then fine-tune its position with the microadjuster. Cinch up the thumbscrew to lock the bearing in position.

A specialized guide bearing, *above*, helps narrow blades (⅛" and 1⁄16") track true during curved cuts. The rear of the blade rides in a groove in the bearing's edge. The groove provides side-to-side support and the bearing reduces friction. (Guide conversion kit, $150–$250; Blade Stabilizer, $80, Carter Products, 888-622-7837, carterproducts.com.)

Block party ▲

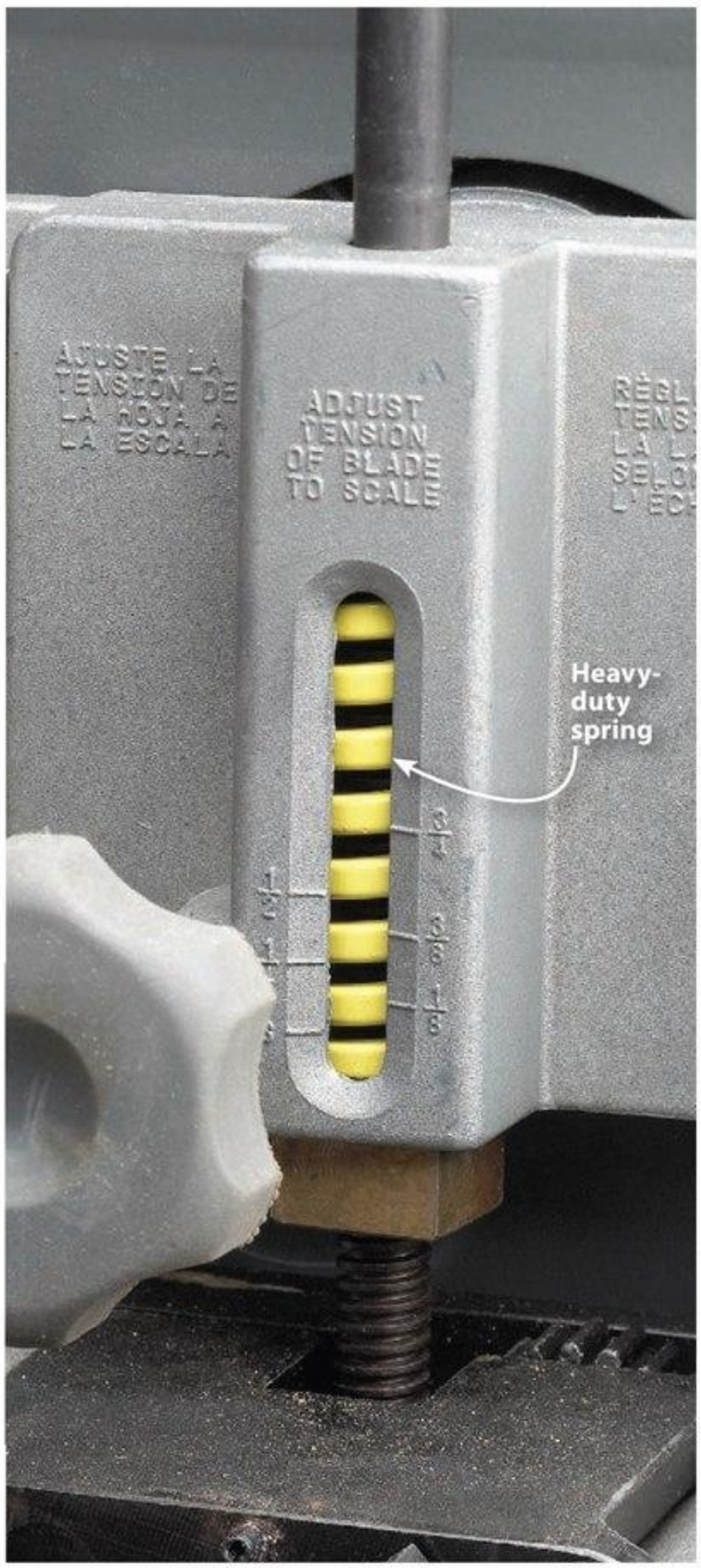
If you don't have the budget for bearing guides, ceramic guide blocks provide an inexpensive upgrade from the factory-supplied metal blocks. The large, flat faces provide the same solid blade support, but the ceramic material generates less friction, so they run cooler. That translates into longer blade life. Installation is as simple as loosening a bolt or thumbscrew to remove the steel blocks, then putting the ceramic blocks in place. They wear so well that the manufacturer guarantees them forever. (Ceramic guide blocks and thrust bearings, $18, item 49213, Hartville Tool, 800-345-2396, hartvilletool.com.)

Fence me in ▶

For resawing and straight-line rips, a good fence is essential, yet many saws come with no fence or a poor-performing one. The Kreg fence packs a lot of features in an affordable package. It pivots to account for blade drift (the tendency of a blade to pull to one side). For sawing thin, narrow stock, mount the fence with the wide face down on the table. It can then extend under the guide assembly, even with the assembly close to the tabletop. The fence easily lifts off the rail for quick switching from straight cuts to freehand work. An optional micro-adjuster makes precise fence movements easy. (Rip fence, No. KMS7200, $120; Micro-adjuster, No. KMS7215, $15; Kreg Tool, 800-447-8638, kregtool.com.)

Tension is a good thing

Like any of us, a bandsaw occasionally needs relief from tension–the tension needed to keep its blade cutting true, that is. Relieving that tension extends the life of the wheel bearings and tires, and makes blade changes possible. These accessories simplify taking your saw from tightly wound to relaxed and back again.



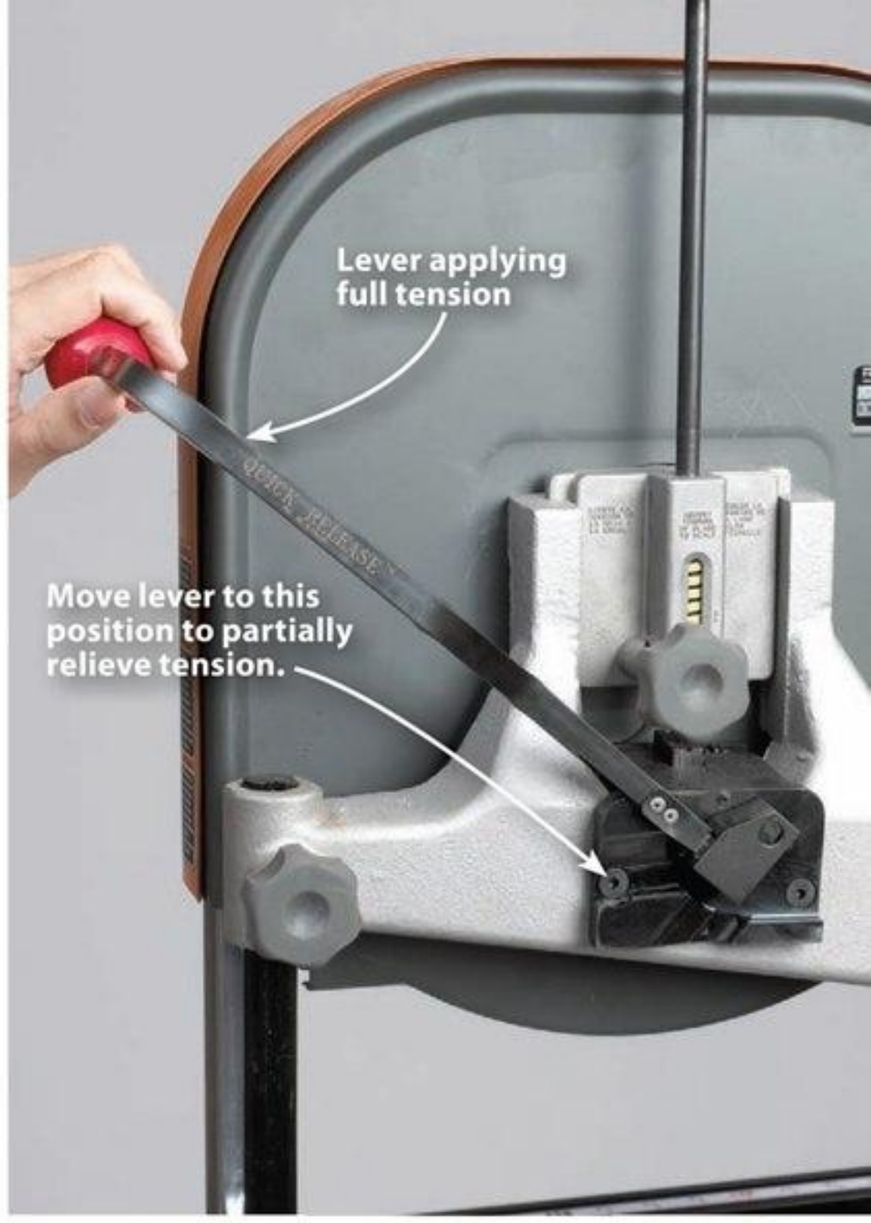
Put the squeeze on ▲

Bandsaw springs, like all of us, lose their ability to bounce back as they get older. If yours no longer has enough "oomph" to tension wide blades, replace it with a heavy-duty aftermarket spring. On most saws, installation goes quickly and doesn't require any special tools.

We found that after installing a stronger spring, it took fewer turns of the tensioning knob to properly tension a blade. With springs to fit most sizes of bandsaws, this inexpensive upgrade offers a lot of bang for your buck. ($12–$18, Iturra Design, 904-642-2802.)

Take 'er for a spin ▲

Small tensioning knobs prove difficult to grip, don't provide much leverage, and only allow half of a rotation before you need to change your grip. Turning them can literally be a pain. Mount a 6"-diameter cast wheel with a spinning handle, and adjusting blade tension becomes easy. The chrome finish prevents rust and looks nice, too. (Item 10888 $47, Iturra Design, 904-642-2802.)



Instant tension relief ▲

A quick-release lever applies or removes blade tension in a snap. In the up position, the mechanism keeps the blade under tension, ready for use. Pivot the lever down toward the table to release all tension for blade changes and between work sessions. The middle position relieves stress on the wheels and saw frame, but provides enough tension to hold the blade in place while mounting a blade and checking tracking. This upgrade took about 15 minutes to install, a small investment quickly regained with faster blade changes. (Carter Products, item QR, $159, 888-622-7837, carterproducts.com.)

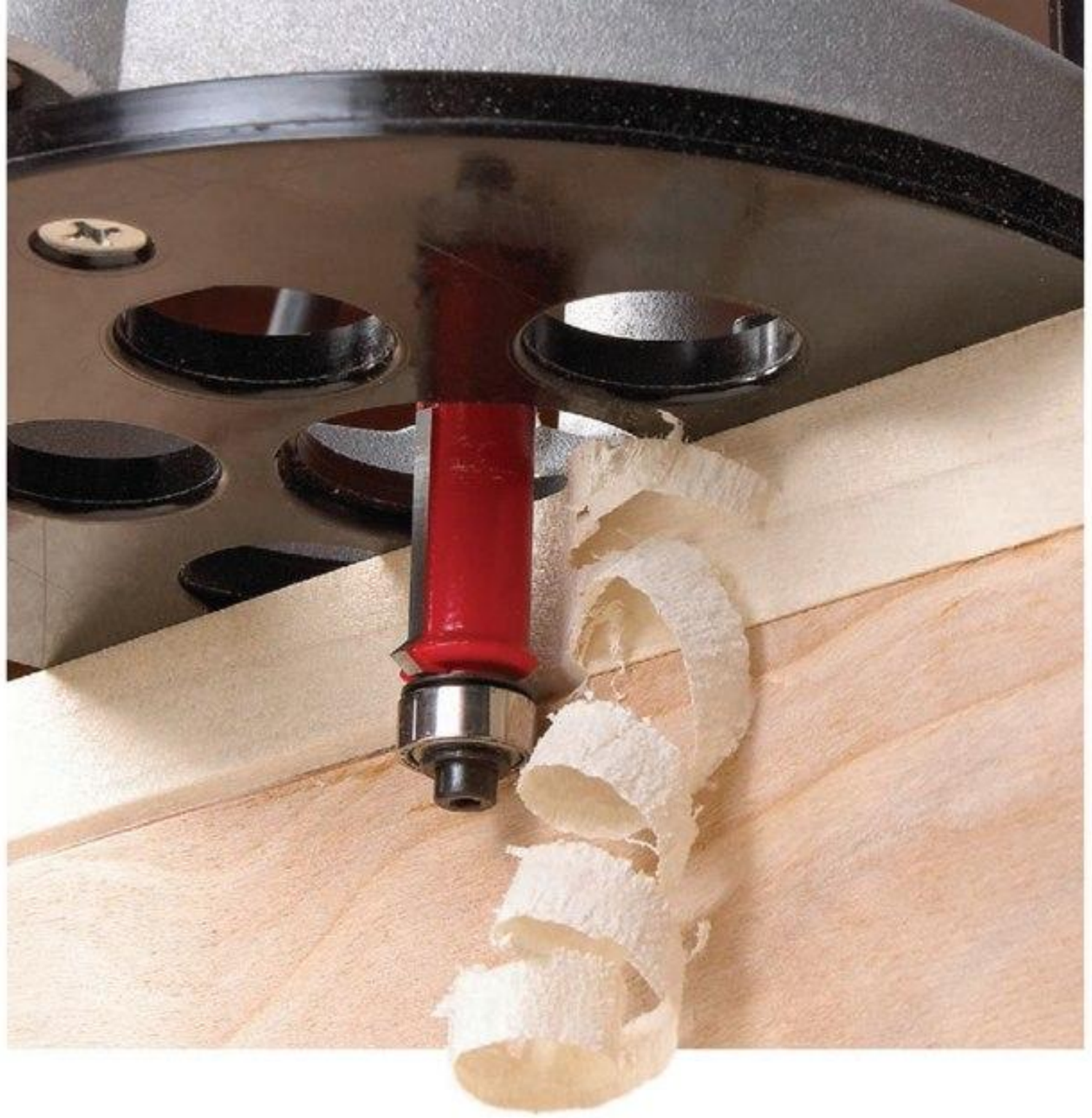
Time to lighten up

No bandsaw add-on will help much if you can't see your work. So defeat the forces of darkness with a task light. The magnetic base on this one sticks to any steel or iron surface, and the gooseneck puts the light exactly where you need it. Eleven LEDs shine a bright spotlight without the heat of incandescent bulbs. Juice comes from four AA batteries in the base, or use the optional AC power cord. ($55, item 26429, Rockler, 800-279-4441, rockler.com.)

Written by **Craig Ruegsegger** with **Bob Hunter**

Turn defects into details

To err is human. To hide your mistakes using a flush-trim V-groove bit is divine.



The bit's bearing rides on the cabinet side as the cutter slices the face frame flush and adds the V-groove.

Not every face frame and cabinet case go together like a match made in heaven. The frame may slightly overlap the case sides, or hairline gaps may emerge after the glue-up. That's when you need the perfect solution for an imperfect world: a flush-trim V-groove router bit.

These bits look and work much like straight flush-trim bits with one exception: A V-shape groove-cutter extends about 1/16" past the bottom-mounted pilot bearing and cutters, as shown *below*. This V forms a groove on the joint line between the face frame and the case; the rest of the bit trims the frame edge flush, as shown *above*.

On cabinets with a clear finish, the groove helps mask hairline gaps. On painted cabinets, it works like an expansion joint in concrete, concealing cracks that inevitably form between the face frame and the case, as shown *below*. Such a shallow groove won't interfere with pocket-hole screws or other fasteners.

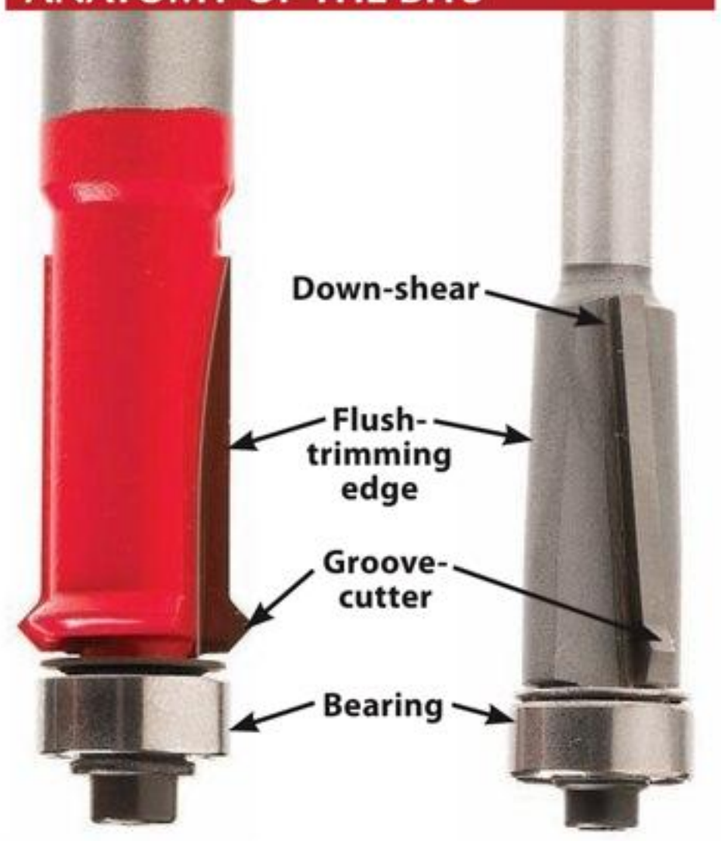
Bits from most manufacturers use cutters running straight up and down. If you're working with figured wood or species prone to tear-out with straight cutters, choose a bit with an angled (down-shear) edge, *below left*, that slices as it cuts for smoother results.

Find your groove

Size the face frame or rough-cut it so you trim off less than 1/16" of waste to avoid tear-out. Place the router base on the face frame, as shown *above*, and adjust the bit depth until you center the groove over the joint. Check that the bearing rides against the case.

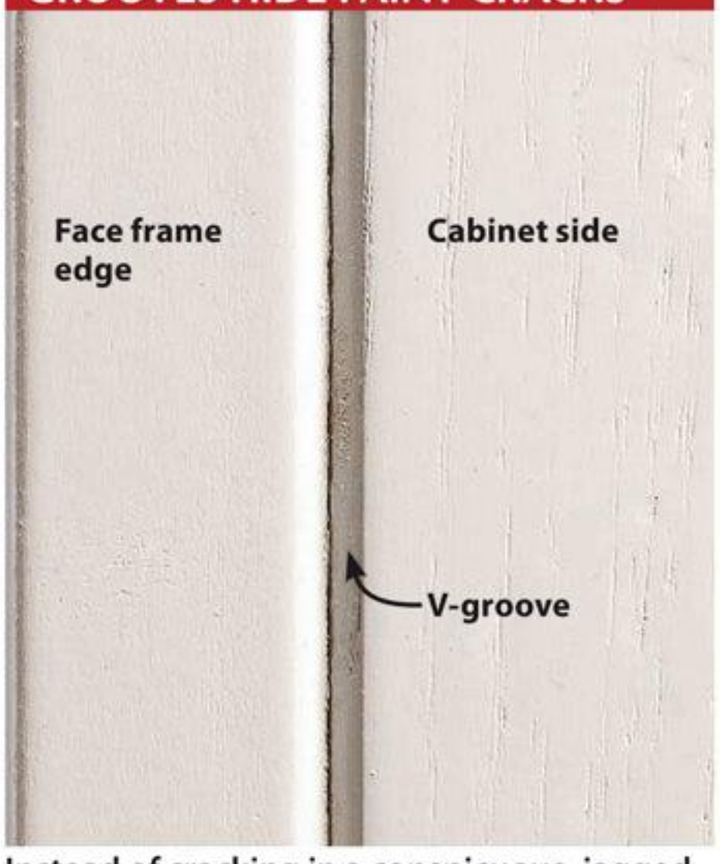
Then start the router and move it counterclockwise, trimming first along the end grain on the frame stiles. Routing the sides last removes tear-out. To smooth any rough spots, use 220-grit sandpaper wrapped around a hardwood scrap block.

ANATOMY OF THE BITS



You'll find flush-trim V-groove bits with flush-trimming edges that run straight up and down (left) and those with angled, or down-shear, edges (right).

GROOVES HIDE PAINT CRACKS

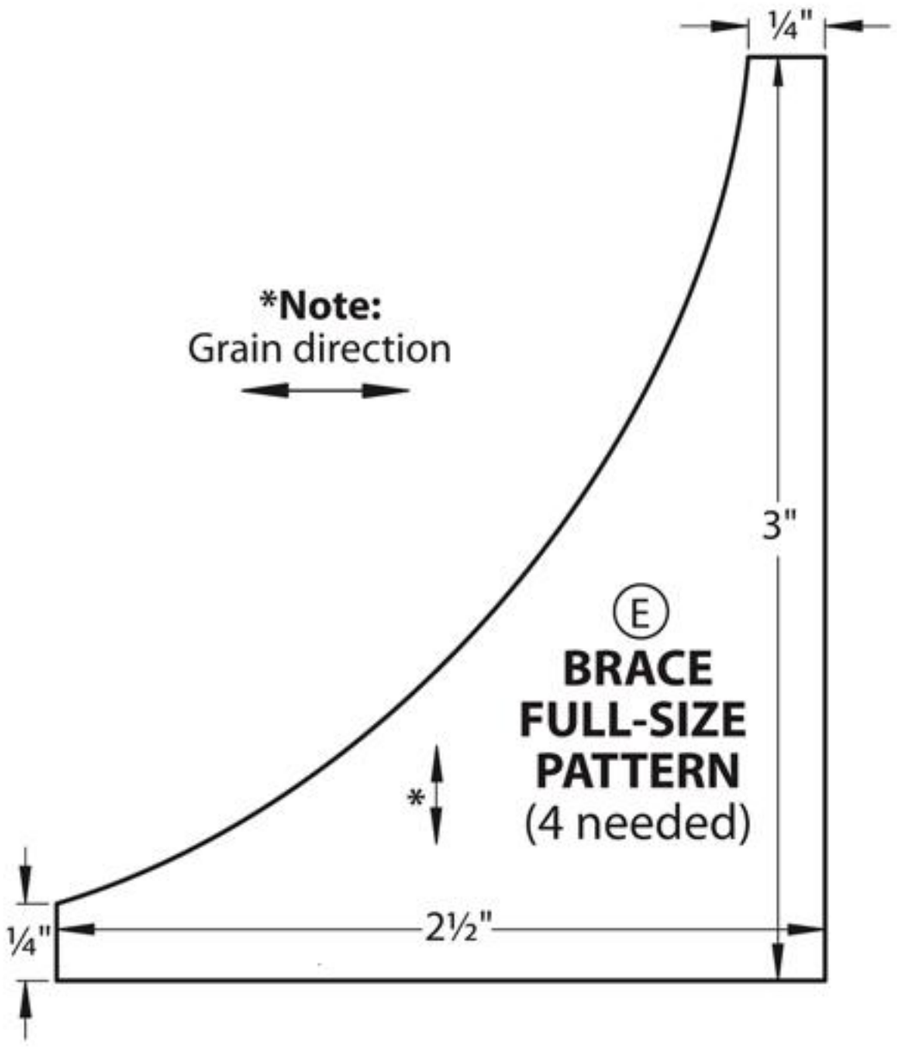


Instead of cracking in a conspicuous, jagged line on the cabinet surface over the joint, paint cracks at the bottom of the V-groove where it remains hidden.

Sources

Supplier	¼" Shank No./Price	½" Shank No./Price
Eagle America 800-872-2511 eagleamerica.com	117-1002, $25	117-1005, $27
	117-1012*, $26	117-1015*, $28
Freud 800-334-4107 freudtools.com	48-102, $28	48-112, $29
Grizzly 800-523-4777 grizzly.com	C1470, $17	
MLCS 800-533-9298 mlcswoodworking.com	6505, $10	8805, $10
Rockler 800-279-4441 rockler.com	21067, $21	21074, $21
Woodline USA 800-472-6950 woodline.com	WL-1295, $13	WL-1296, $13

* Bits have a down-shear cutter angle.



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WOOD® PATTERNS®

May 2011 *Issue 204*

Dear Reader: As a service to you, we've included full-size patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Materials List and the drawings accompanying the project you're building.

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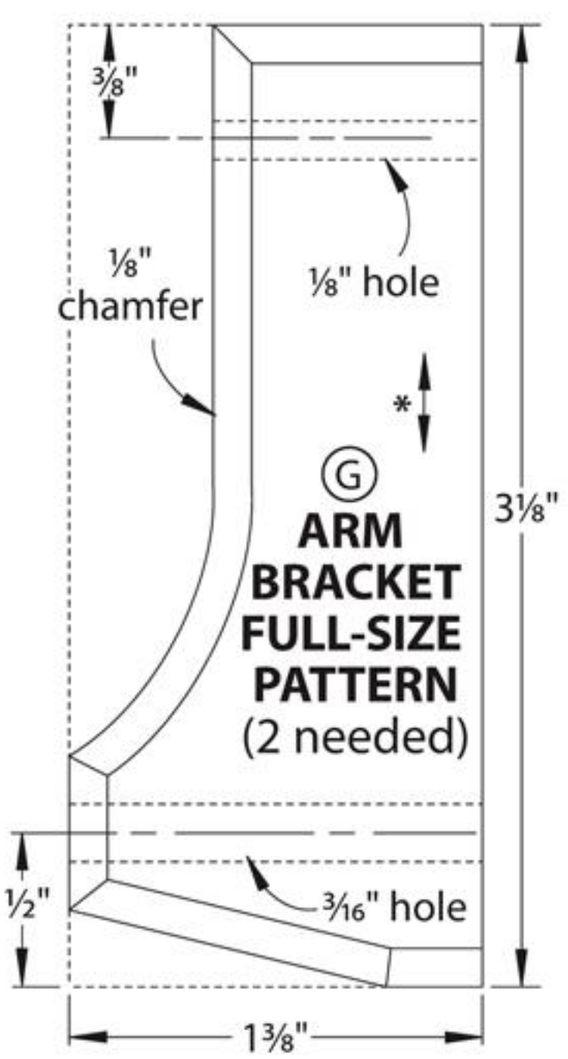
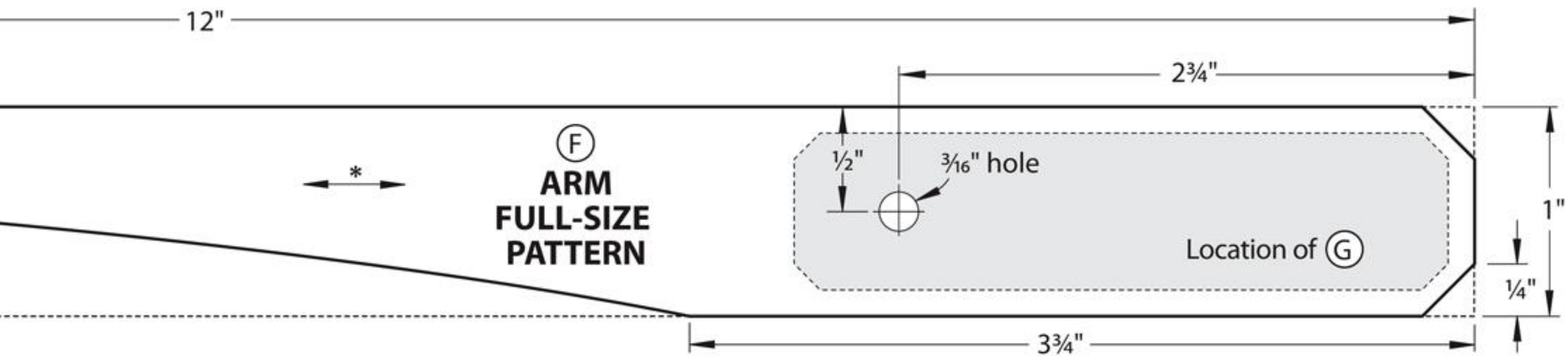
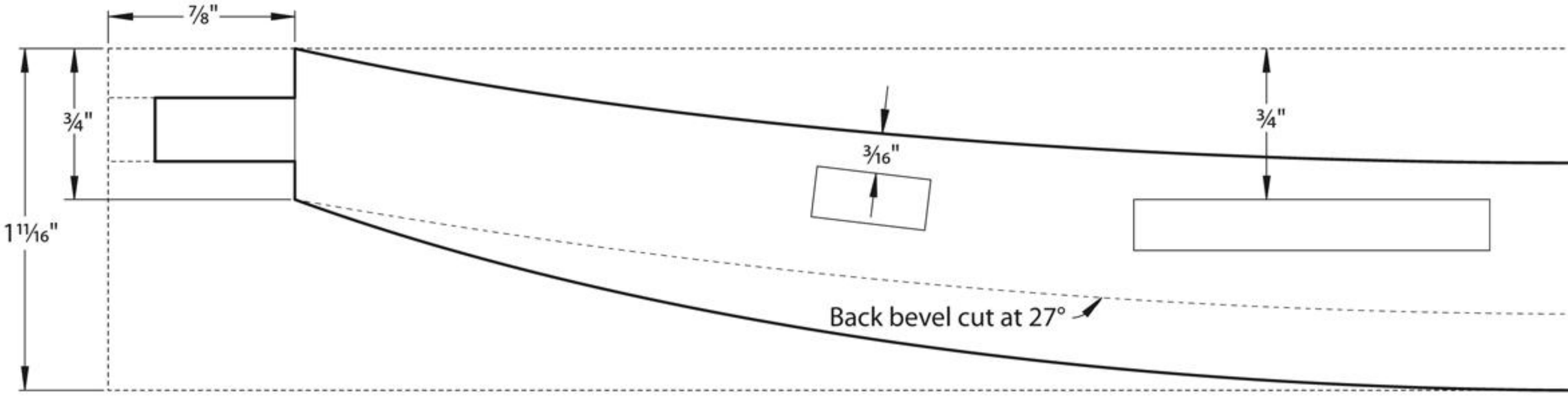


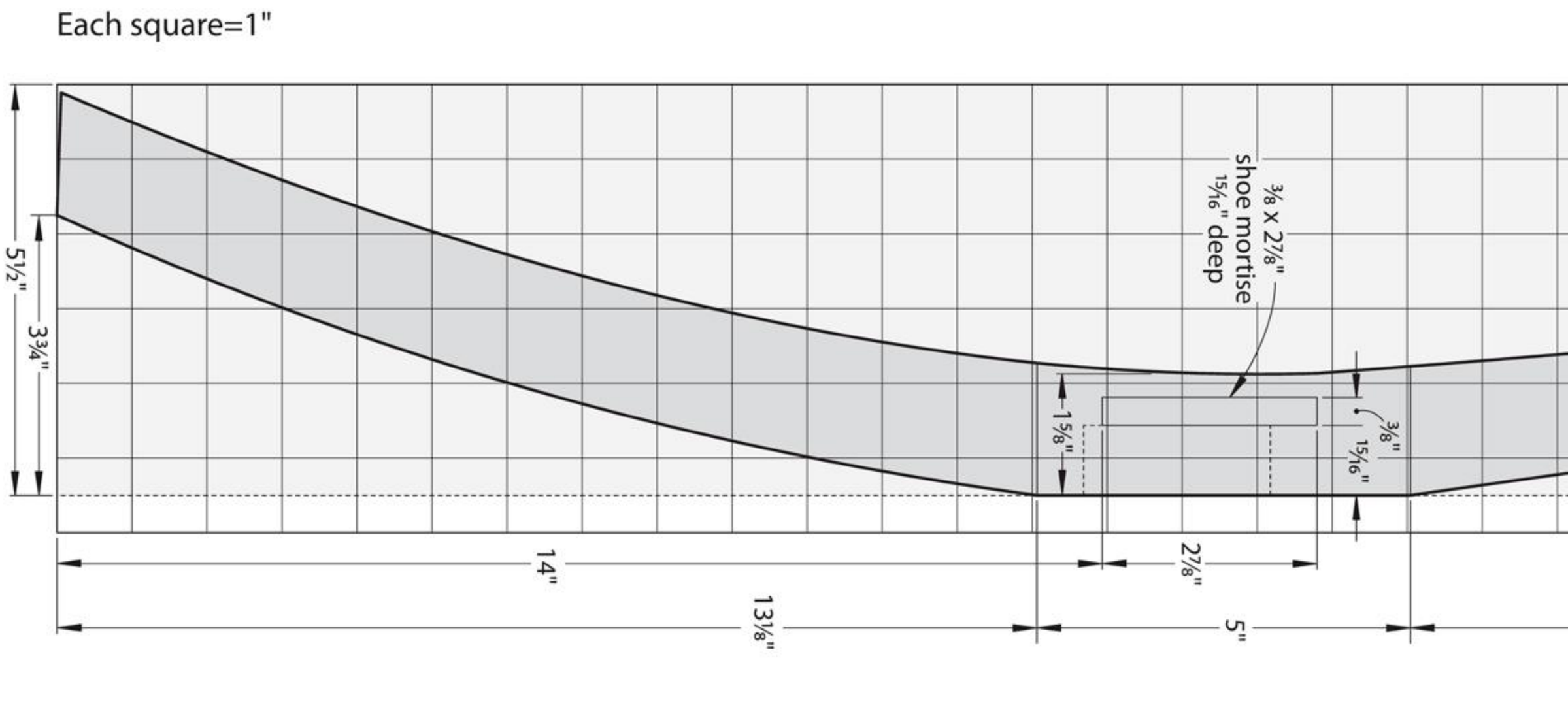
Desktop Trebuchet
Page 70

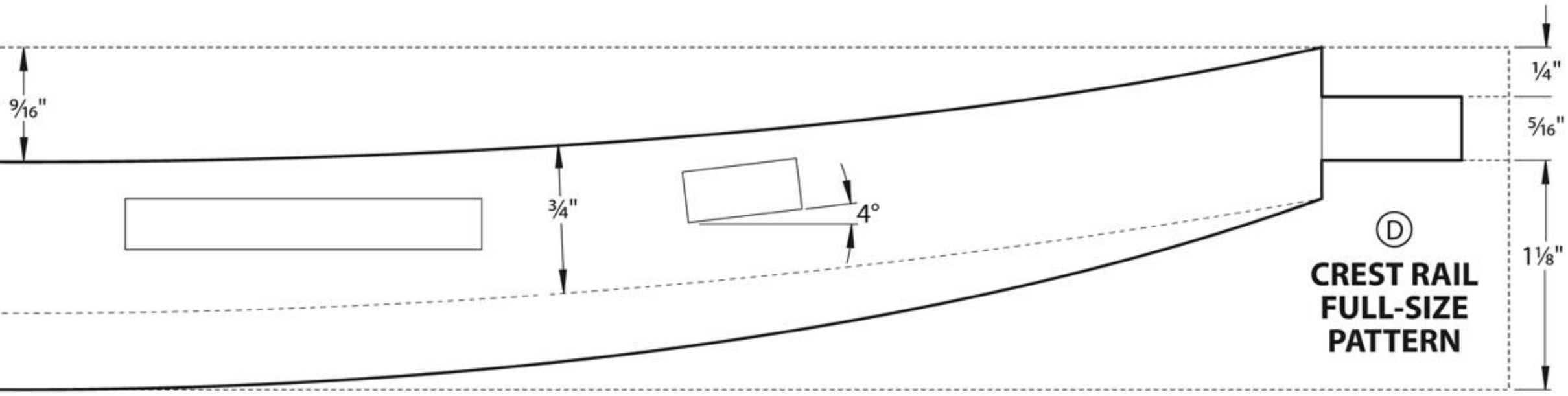




For a Mission chair plan visit:
woodmagazine.com/missionchair

Each square=1"

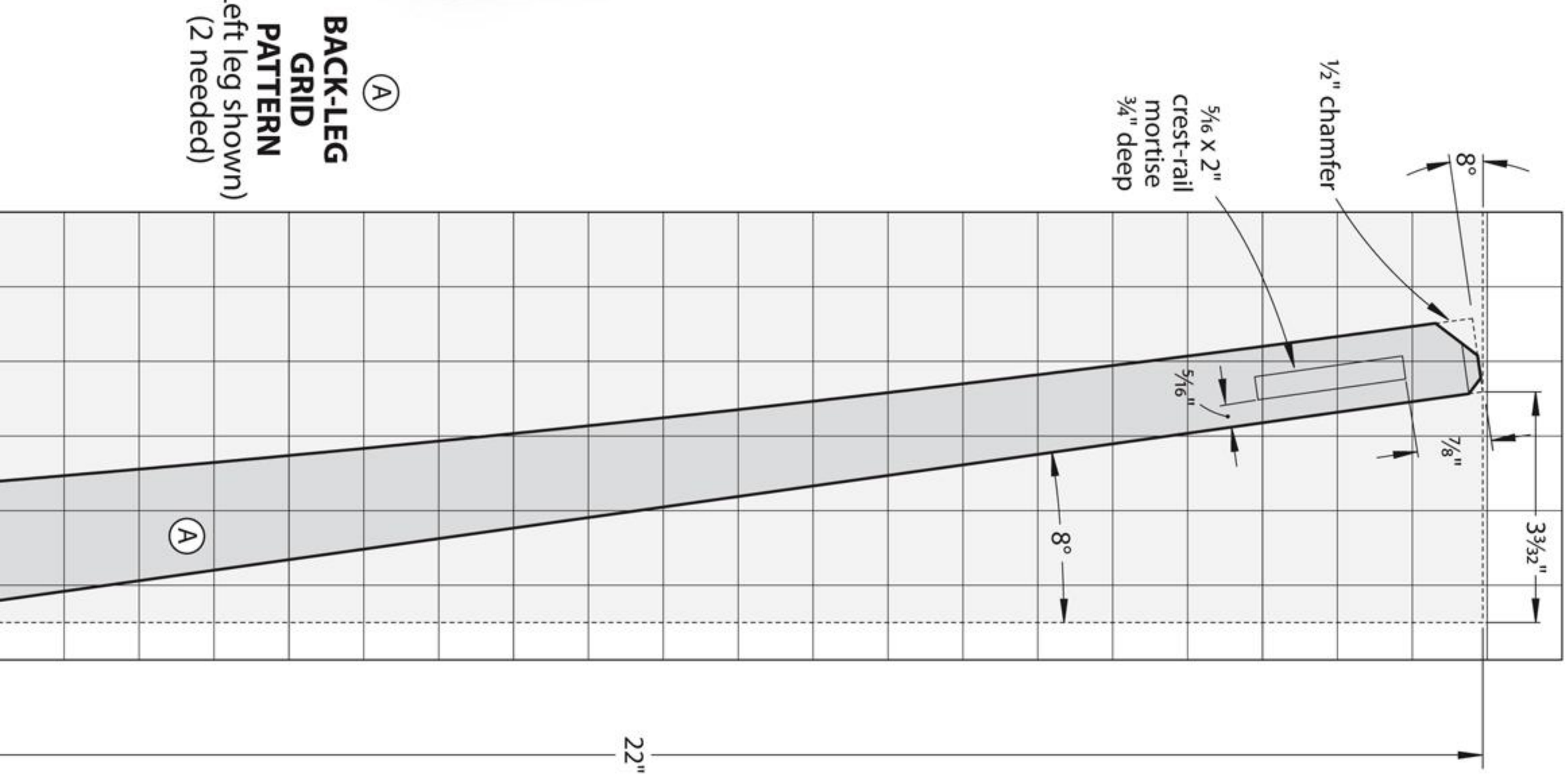


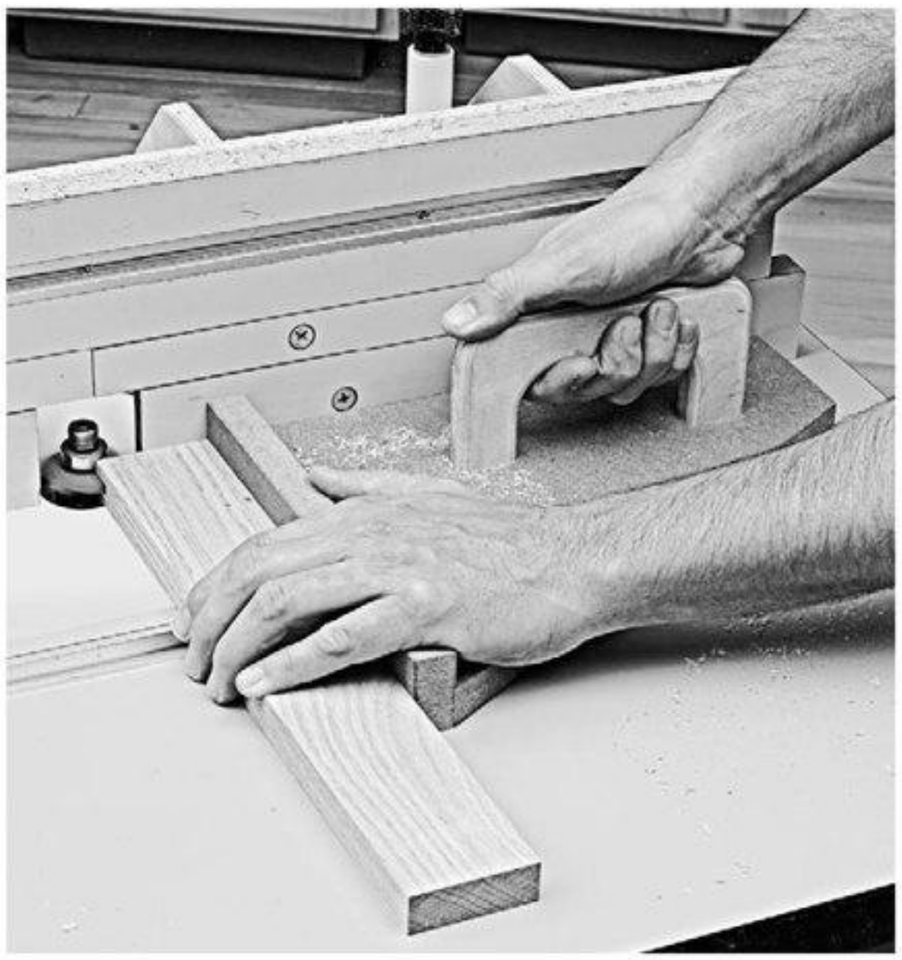


Dining Room Chair
Page 56

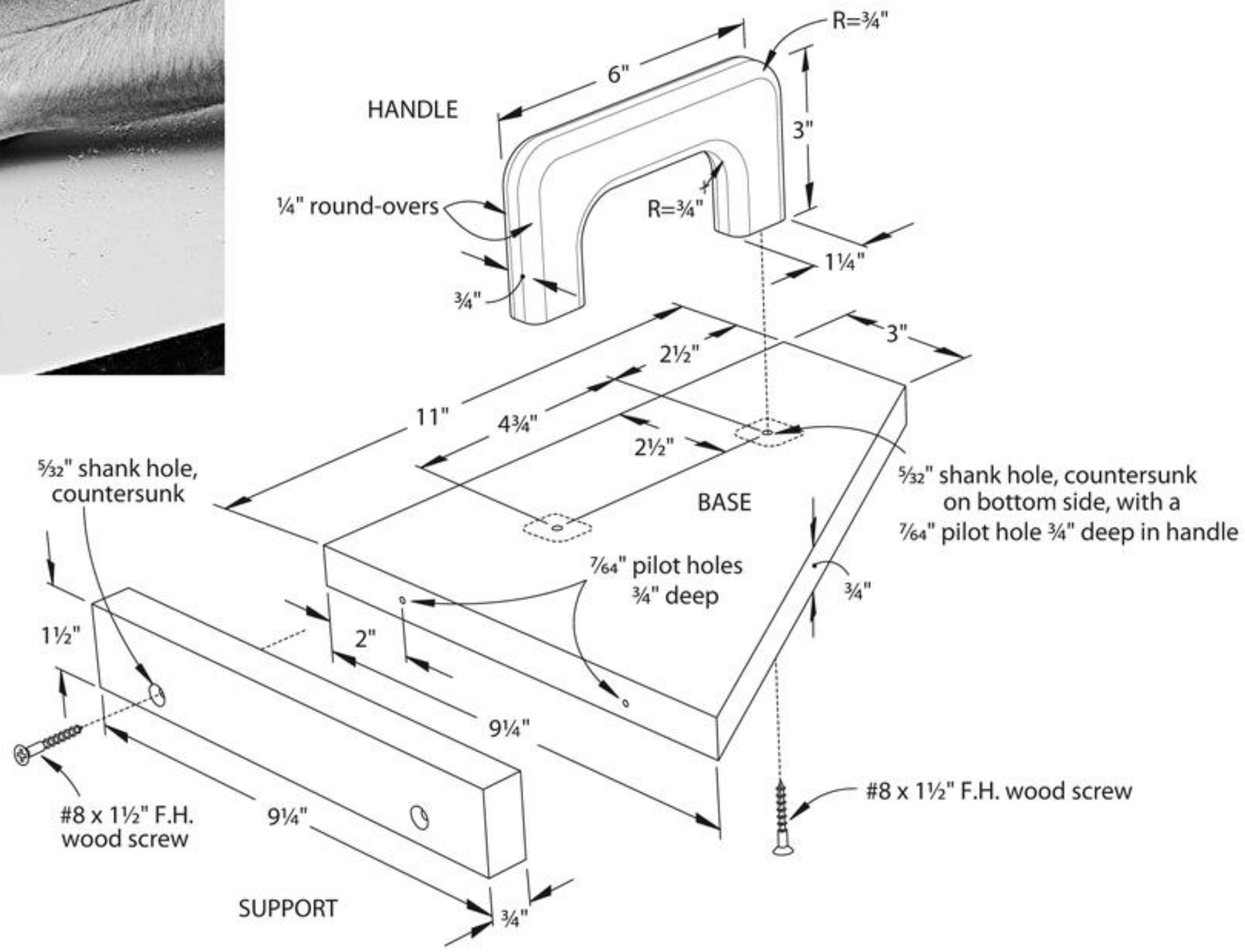
Ⓐ
BACK-LEG GRID PATTERN
(Left leg shown)
(2 needed)

To download a FREE full-size back leg pattern, go to **woodmagazine.com/chairleg**.





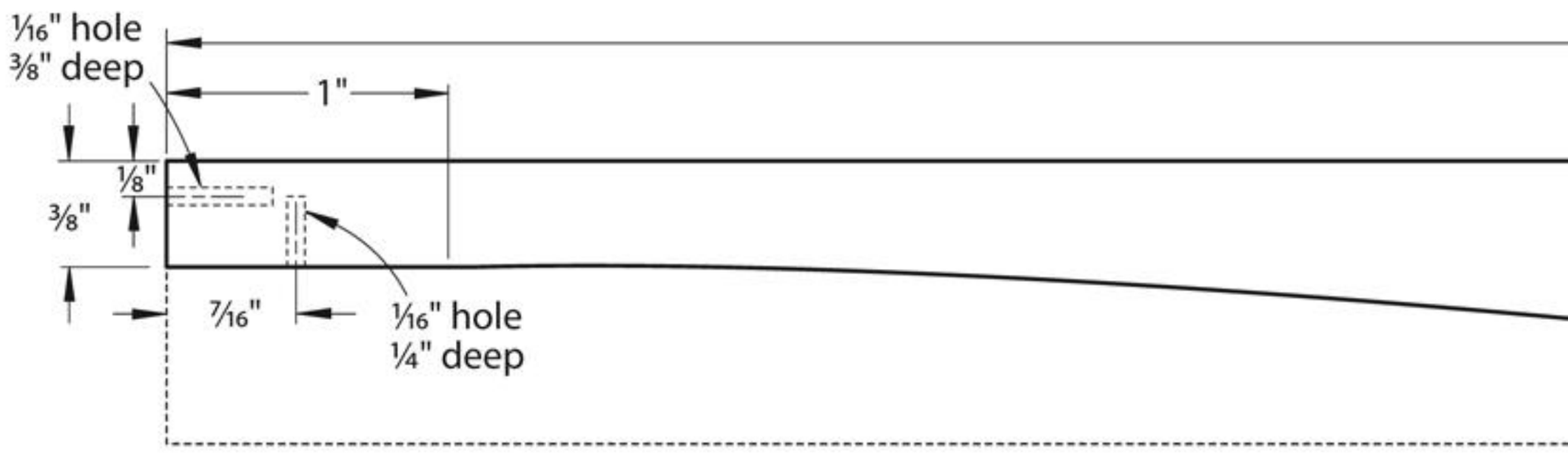
Right-angle Router-table Push Block



Please work safely

In your work, be sure to use all safety devices, as well as wearing vision, breathing, and hearing protection.

—WOOD magazine editors



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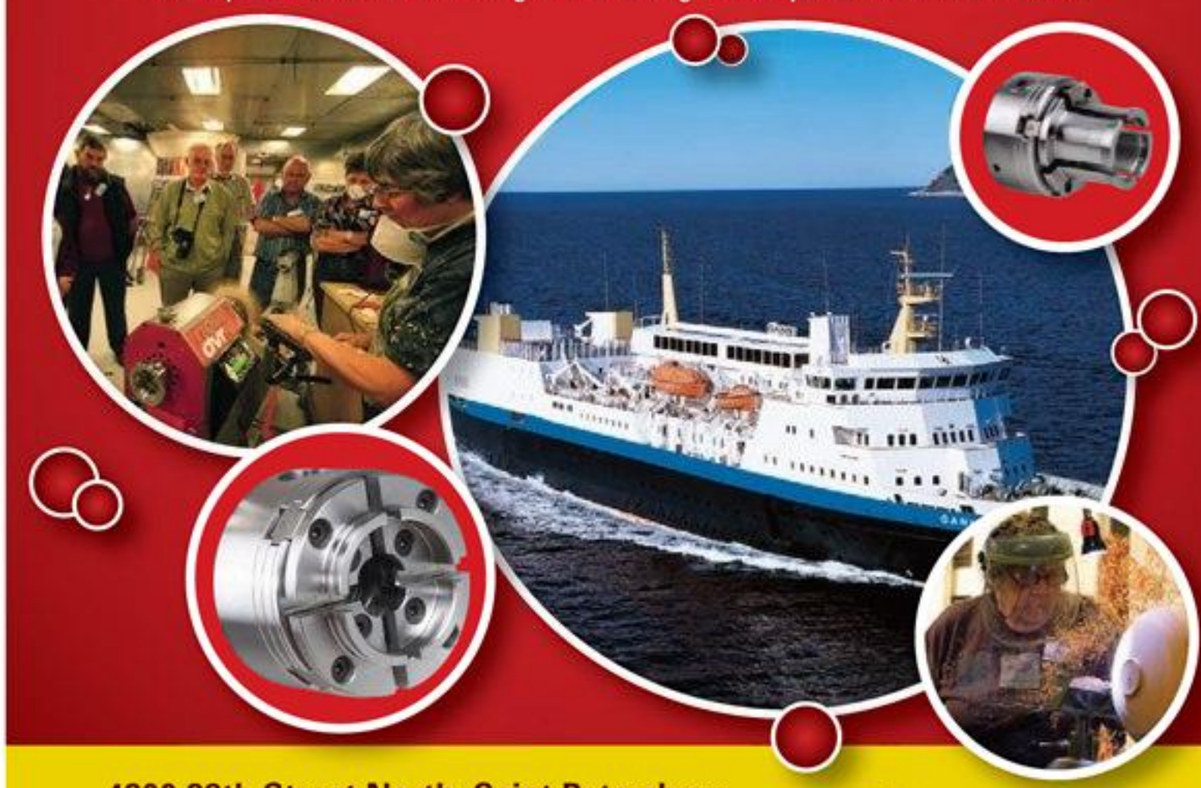

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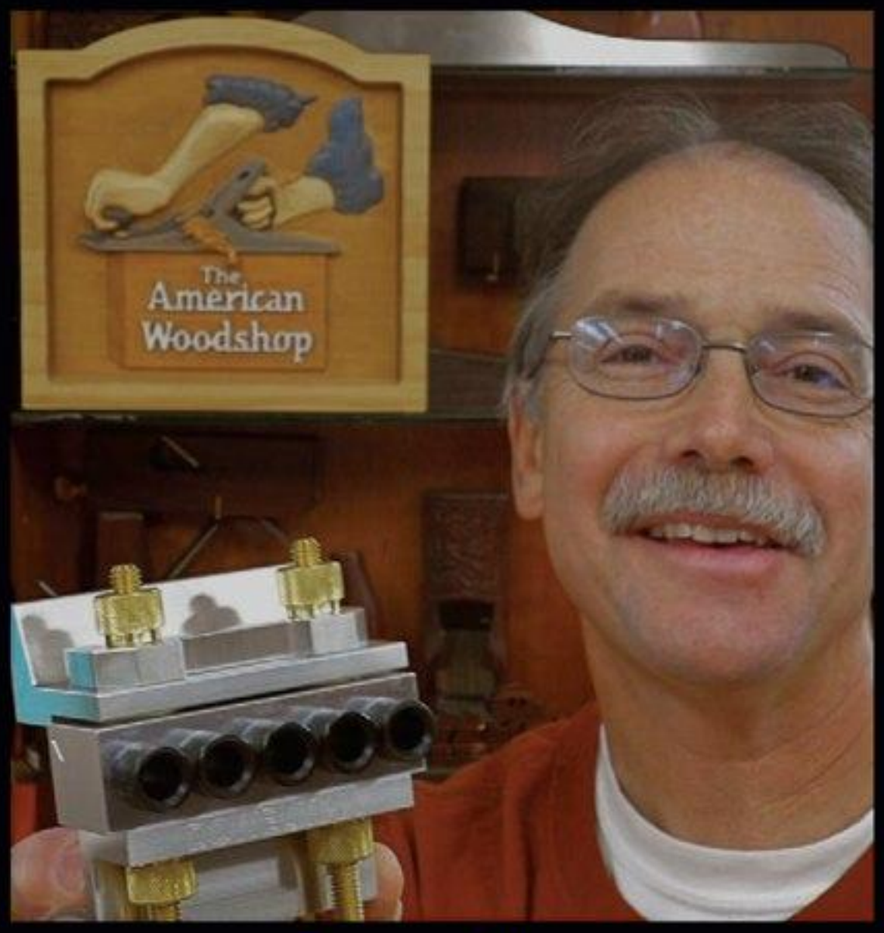

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Table Lamp

Here's a bright idea: a light fixture you can build in a weekend. Watts not to like?

A good place to start on this project may be in your collection of too-good-to-throw-away cutoffs. It takes less than two board feet of lumber for the column (we used ash), and some scraps of a contrasting species for everything else (cherry on ours).

The column consists of four tapered corner pieces joined with splines that create the recesses accenting each face. This assembly also includes a hollow center for the power cord. Let's start off by constructing the column.

Overall dimensions:
6¼" wide × 6¼" deep × 18⅛" high
without lamp hardware and harp.

AT A GLANCE

- Find complete lamp hardware kits at home centers and lighting stores.
- Customize the look with a lamp shade suitable for your decor.

CUT IT CLOSE

Taper one face of each column corner (A). After cutting and smoothing this taper, lay out the second taper on the newly cut face.

Corner-cutting encouraged

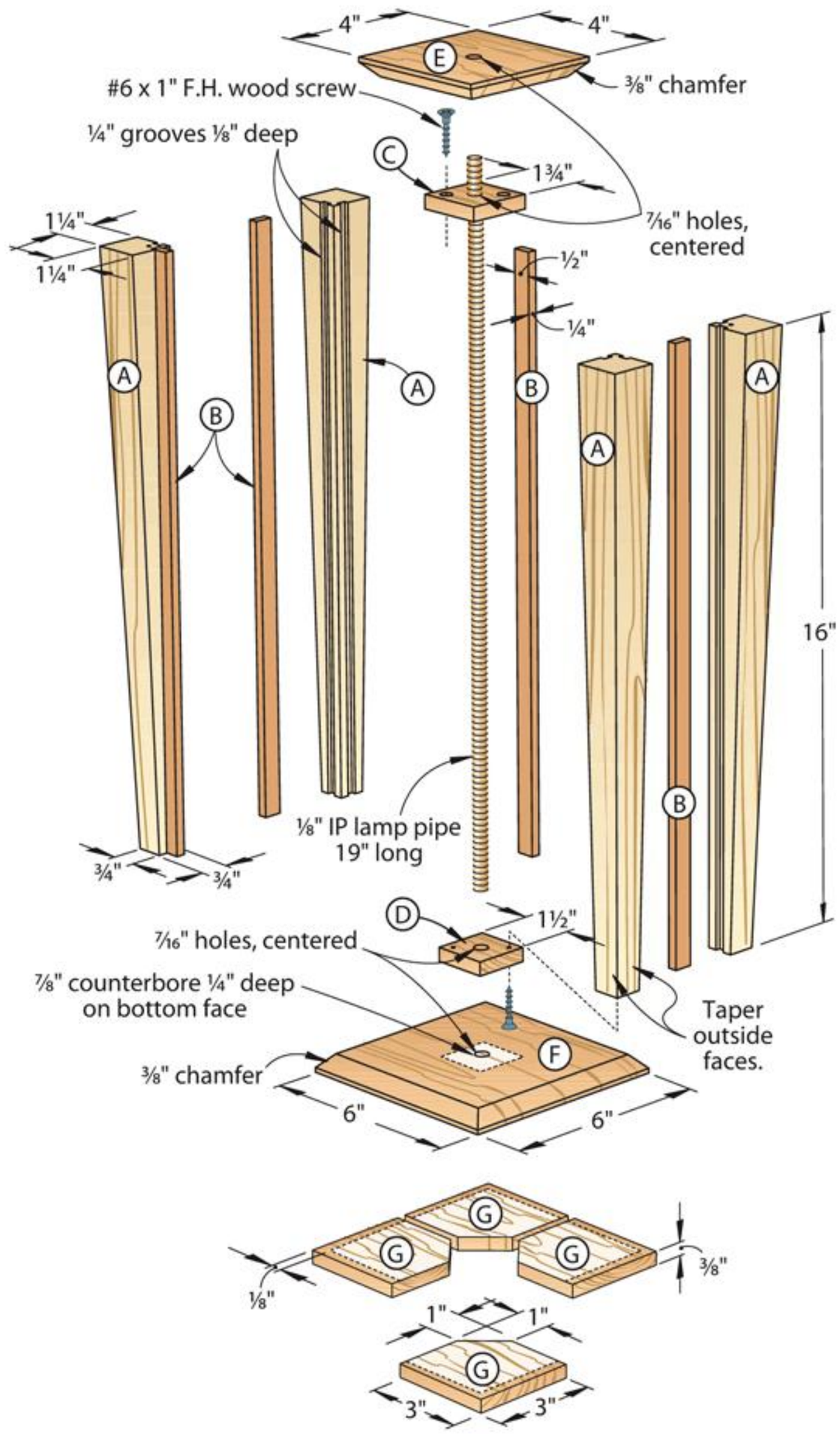
Quick Tip! No lines, no waiting. Cut the column corners (A) from 6/4 or 8/4 stock if you can, and eliminate glue-up time and joint lines. If you don't have thick stock, laminate two layers of ¾"-thick stock for the four column corners, then cut them to size [**Materials List**, *page 53*].

***Note**: When planing glued-up column corners to thickness, remove equal amounts from each face so the joint line remains centered.*

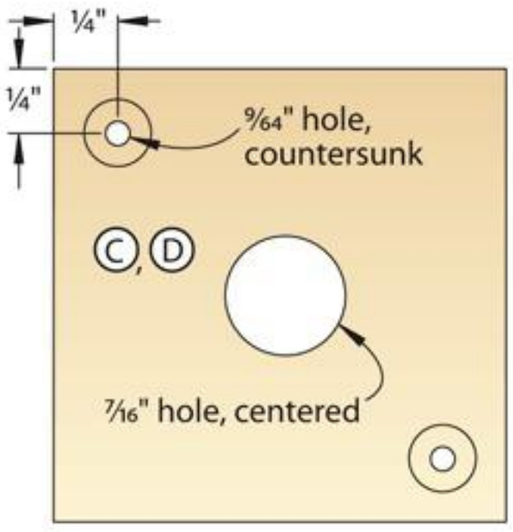
2 Position the four column corners (A) with the grain oriented as shown in **Drawing 1b**; then mark each of the faces that will receive a groove. Set up a ¼" dado blade in your tablesaw and cut the ⅛"-deep grooves.

3 Lay out a taper on one ungrooved face of each column corner (A) [**Drawing 1**]. Cut just outside the line on the bandsaw [**Photo A; More Resources,** *page 53*]; then smooth the face with a jointer, hand plane, or belt sander. Mark the second taper on the adjacent ungrooved face of each column corner and repeat the process.

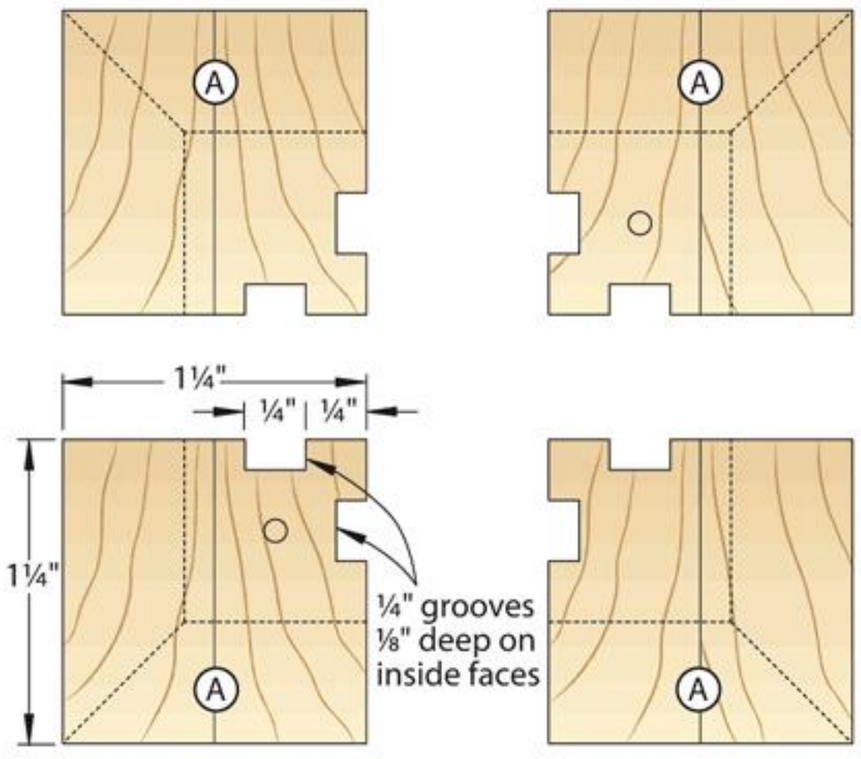
1 EXPLODED VIEW

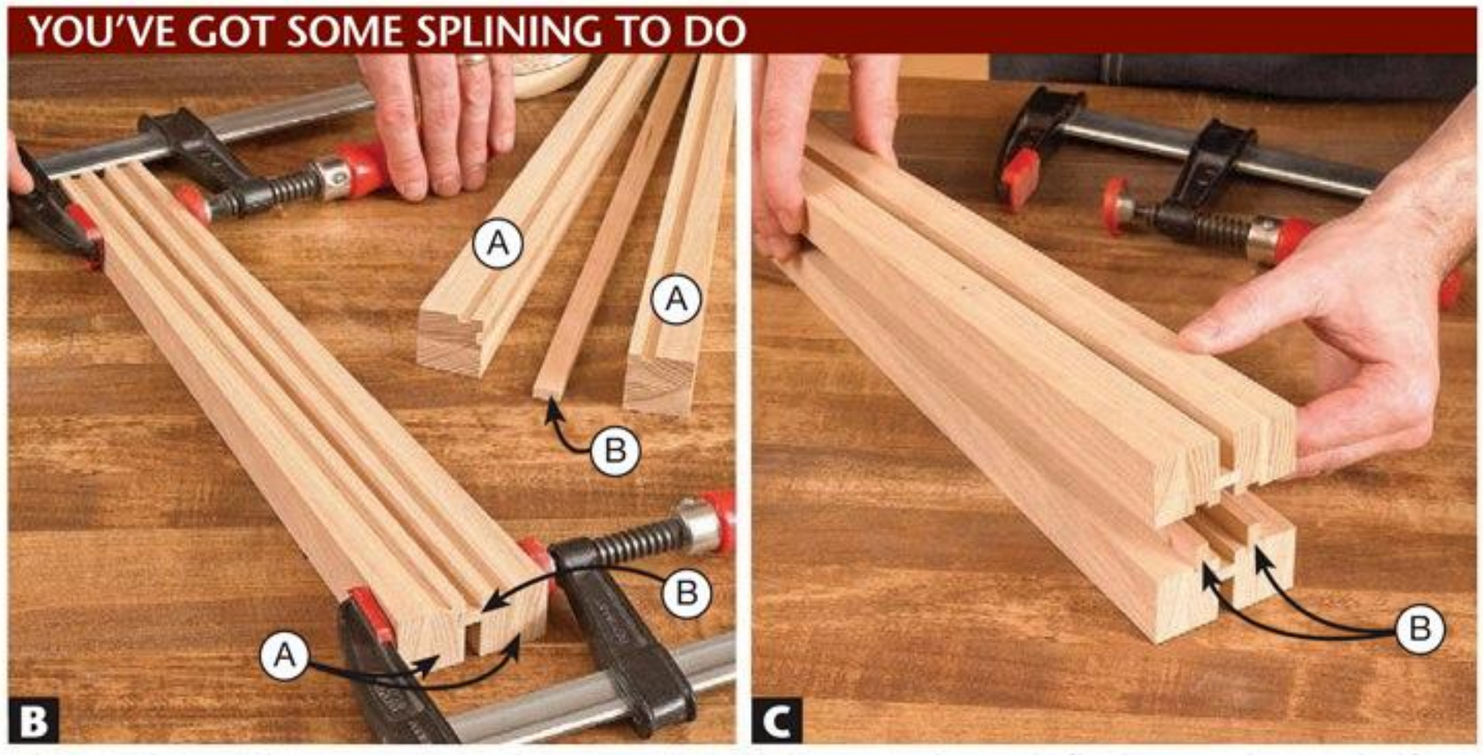


1a COLUMN CAPS TOP VIEW



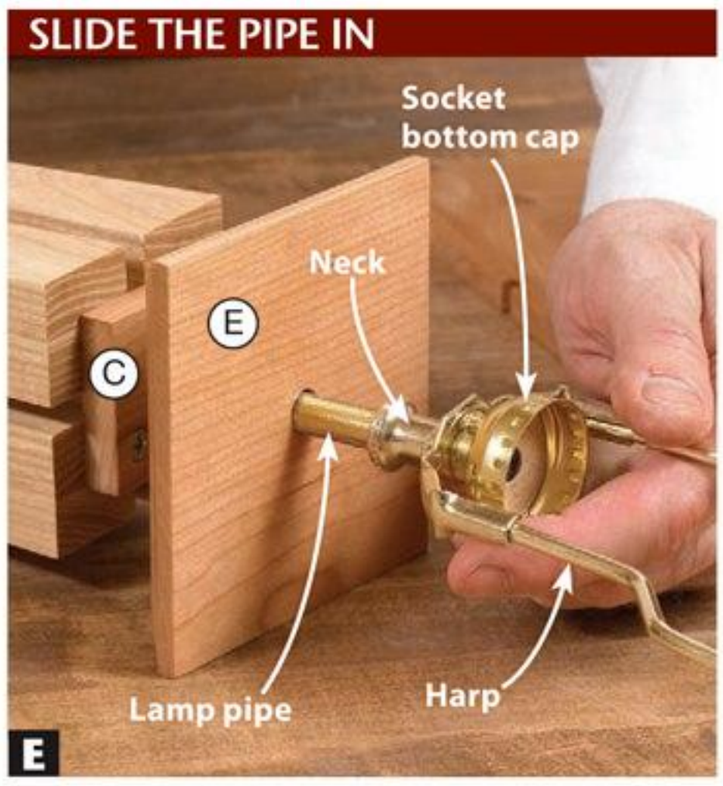
1b COLUMN CORNERS TOP VIEW



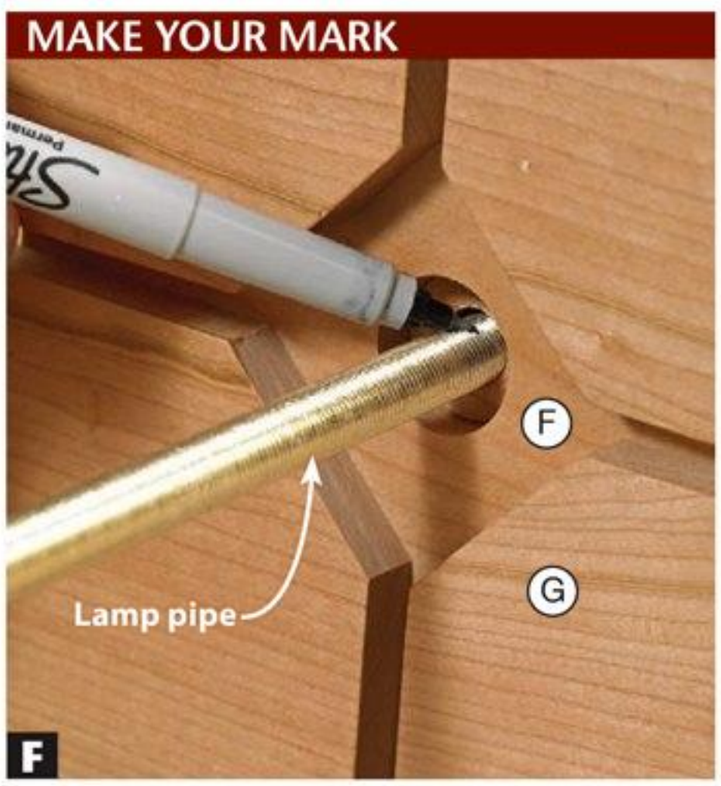


Glue a spline (B) between two column corners (A), keeping the ends flush, to make two half-column assemblies [Photo B]. Then glue and clamp the two half-column assemblies together to make the column [Photo C].

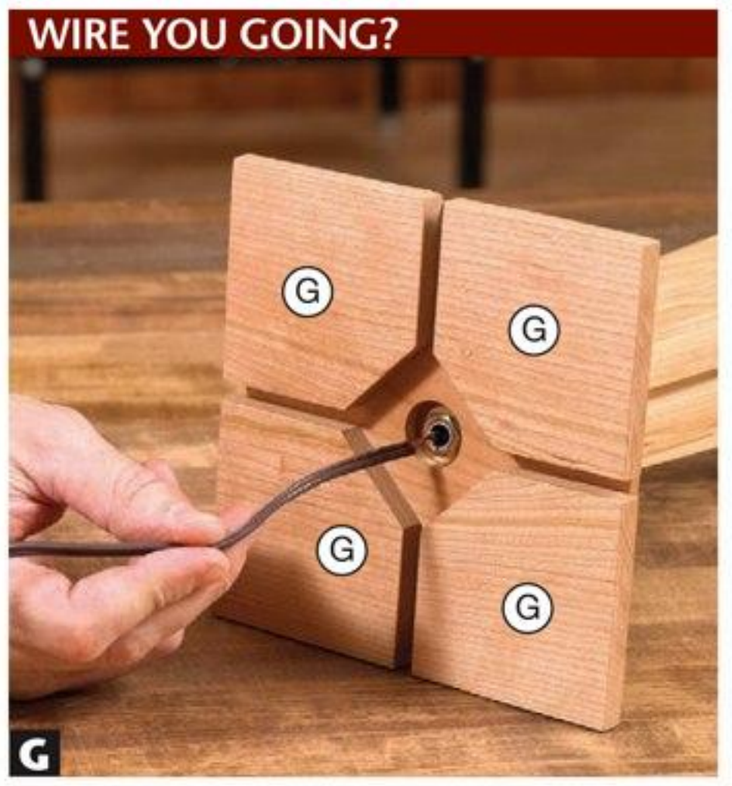
Center each cap (C, D) on the column (A/B), drill pilot holes centered through the shank holes and screw the caps in place.



With the hardware installed on the top of the lamp pipe, push the pipe through the lamp pieces until the neck rests on the top (E).



Using a fine-point permanent marker, mark the pipe's final length flush to the bottom of the lamp bottom (F).



Push the bare end of the cord through the pipe. When the lamp stands up, the cord runs through a channel between two feet (G).

4 Plane a spline blank from contrasting stock to fit the grooves in the column corners (A). Rip four ½"-wide splines (B) from this blank. Finish-sand the column corners and splines up to 220 grit, then glue up these pieces to create the column [**Photos B, C**].

5 Cut the top and bottom column caps (C, D) to size. In each piece, drill a centered 7/16" hole and countersunk 9/64" shank holes near opposite corners [**Drawing 1a**]. Then, screw the caps in place [**Photo D**].

6 From ½"-thick material, cut the top (E) and bottom (F) to size. Rout a ⅜" chamfer around each piece [**Drawing 1**].

7 Using a ⅞" Forstner bit, drill a ¼"-deep counterbore centered on the bottom face of the bottom (F) [**Drawing 2**]. Next, drill 7/16" holes centered on the bottom (F) and top (E).

8 Cut four feet (G) to size. Place the feet on your bench, arranged in a square with the grain of all pieces running in the same direction. Mark the inside corner of each foot, then cut it away [**Drawing 1**]. Finish-sand the top (E), bottom (F), and feet up to 220 grit. Glue each foot to the bottom (F) with the grain running in the same direction as that of the bottom, and revealing ⅛" of the foot's outside edges on each side.

9 Apply finish to all pieces. (We sprayed on three coats of polyurethane, sanding between coats with a 400-grit sponge.)

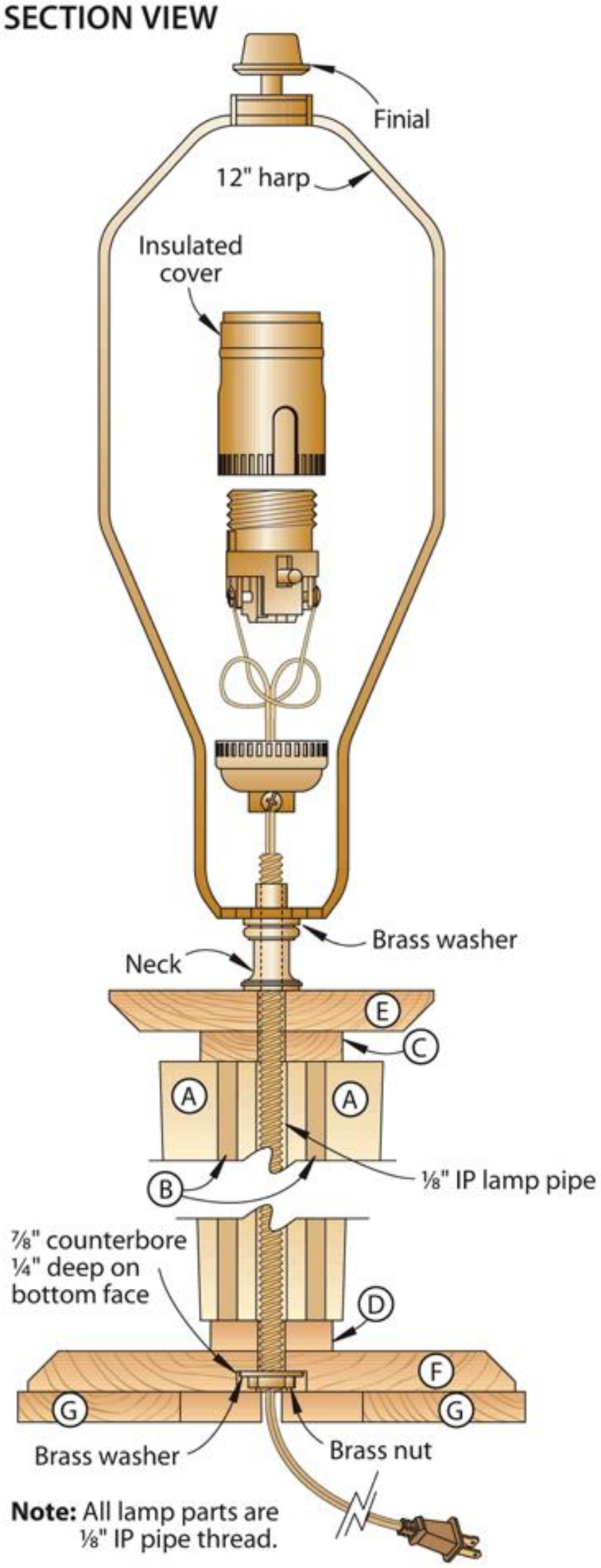
Now, the hard(ware) part

1 Thread the neck, washer, harp, and the socket bottom cap onto one end of the lamp pipe [**Drawing 2**]. Slide the other end of the pipe through the top (E), column (A–D), and bottom assembly (F/G) [**Photo E**]. Press the column, top, and bottom assembly together, and with the neck tight to the top (E), mark the length of the lamp pipe [**Photo F**]. Using a hacksaw, cut the pipe to length, and file away any sharp burrs on the inside and outside of the end, taking care not to damage the threads.

Quick Tip! Use your nut. Before cutting the lamp pipe, thread a nut on the pipe above the cutline. After cutting the pipe, removing the nut cleans up the threads.

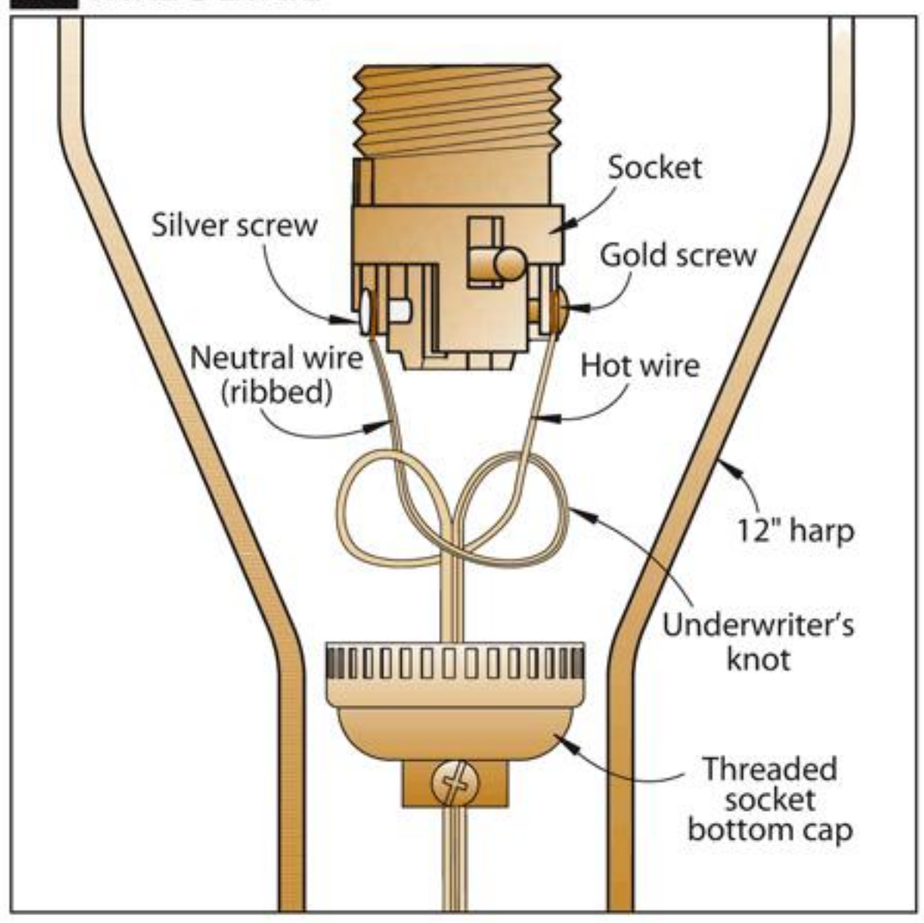
2 To prevent the top (E) and bottom assembly (F/G) from spinning out of alignment, put a small amount of epoxy on the column caps (C, D), then reassemble the pipe assembly, top, column (A–D), and bottom assembly. Slide a brass washer onto the bottom of the

2 SECTION VIEW



Note: All lamp parts are ⅛" IP pipe thread.

2a WIRE DETAIL

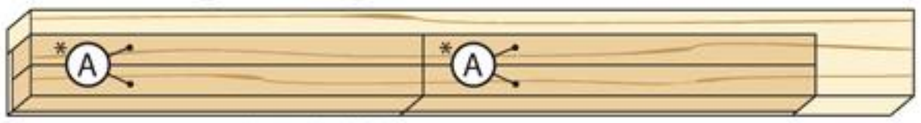


Materials List

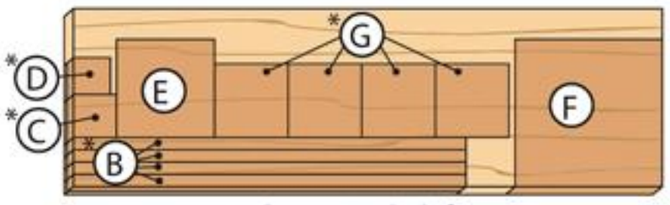
Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	column corners	1¼"	1¼"	16"	A	4
B	splines	¼"	½"	16"	C	4
C	top column cap	⅜"	1¾"	1¾"	C	1
D	bottom column cap	⅜"	1½"	1½"	C	1
E	top	½"	4"	4"	C	1
F	bottom	½"	6"	6"	C	1
G	feet	⅜"	3"	3"	C	4

Materials key: A–ash; C–cherry.
Supplies: #6×1" flathead wood screws (4), make-a-lamp kit.
Blade and bits: Dado set, 45° chamfer bit, ⅞" Forstner bit.

Cutting Diagram



1½ x 3½ x 36" Ash (2 bd. ft.)
*Plane or resaw to the thicknesses listed in the Materials List.



½ x 7¼ x 24" Cherry (.7 bd. ft.)

MORE RESOURCES

FREE VIDEO

- If you don't have a bandsaw for cutting the column corners (A), try this tablesaw tapering jig: woodmagazine.com/taperjig2

pipe, and thread on the brass nut. Align the wood pieces of the lamp; then tighten down the nut on the pipe to pull everything together.

3 Thread the lamp cord through the bottom of the pipe [**Photo G**]. Push the cord through the socket bottom cap and tie an Underwriter's knot [**Drawing 2a**]. Strip away insulation from the cord to expose ¼" of each wire. Secure the neutral wire (ribbed) under the silver screw on the socket, and the hot wire (smooth) under the gold screw.

4 Slide the insulated cover over the socket and press this assembly into the socket bottom cap until it seats firmly. Screw in a bulb, secure a lamp shade on the finial, and your lamp is ready to brighten any room, even when turned off.

Written by **Craig Ruegsegger** with **Kevin Boyle**
Project design: **Jeff Mertz**
Illustrations: **Roxanne LeMoine**; **Lorna Johnson**

Make Cleaner Jigsaw Cuts

And kiss ragged edges and torn-out face grain goodbye!

For cutting curved parts, a jigsaw makes a safe, portable, and affordable choice, compared to a bandsaw or scrollsaw. But a jigsaw's reciprocating blade can leave a cutline littered with splintered shards of wood and torn-out gaps that need mending. It doesn't have to be that way. Read on.

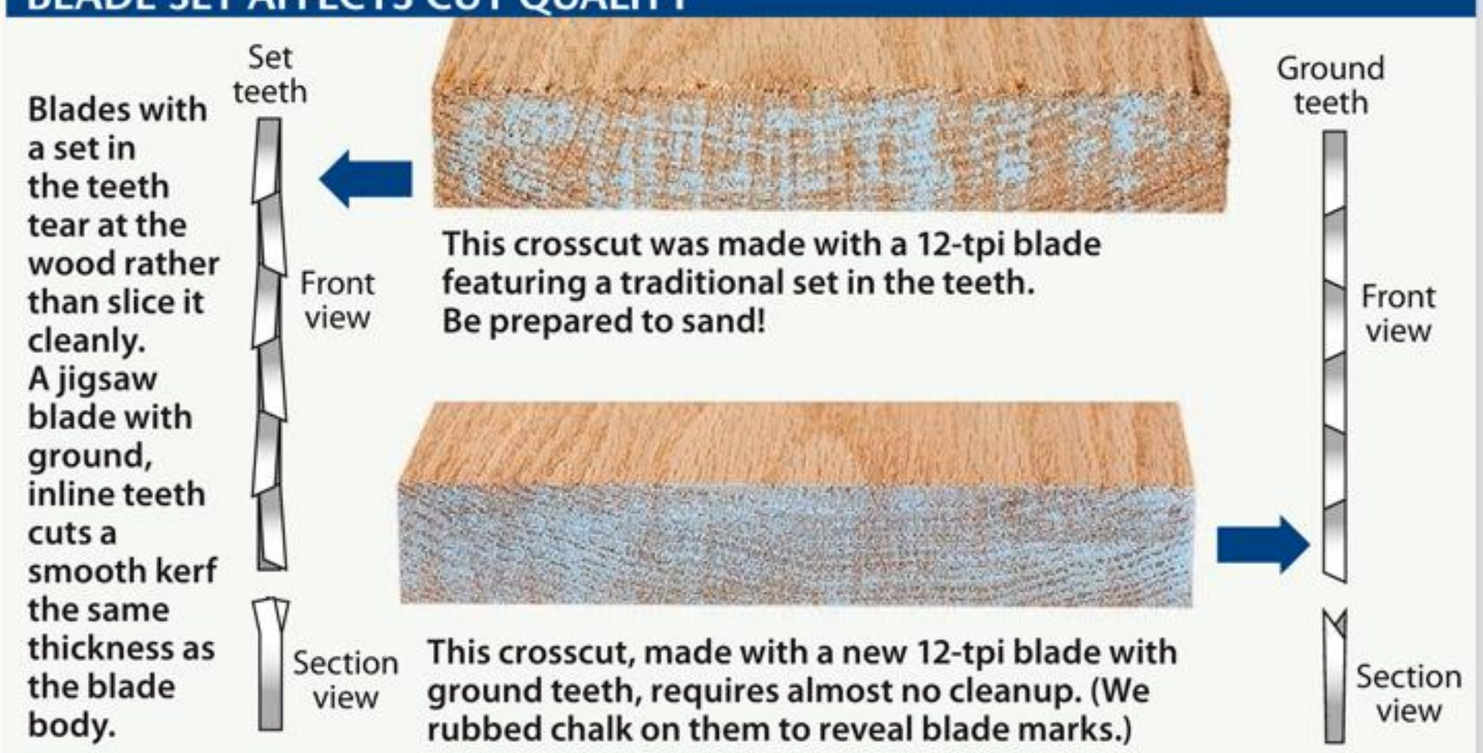
The road from Splinterville starts at the blade

Choose the right tooth count for the cuts you make. Blades with aggressive 6-tooth-per-inch (tpi) designs work great for sawing construction lumber, but cut too coarsely for woodworking project parts. Instead, select a 10- to 12-tpi blade for larger, gradual curves, or a 20-tpi blade for tight curves (1" radius or less) in solid wood and all cuts in plywood or melamine-coated particleboard.

Beyond tooth count, also consider the blade design. For decades, jigsaw-blade teeth were "set," alternately leaning left and right, as shown *above left*. This makes them cut coolly and quickly, but at the expense of cut quality.

To remedy this, several manufacturers now make blades with ground, inline teeth, as shown *above right*, that slice the wood like a surgical scalpel rather than bluntly tear at it. This produces much cleaner cuts. For this reason, in the *WOOD*® magazine shop we use Bosch Clean-For-Wood and Xtra-Clean-For-Wood blades. Just be aware that these blades can burn your wood if you set the jigsaw's speed too fast or feed the saw through the wood too slowly. Our best

BLADE SET AFFECTS CUT QUALITY



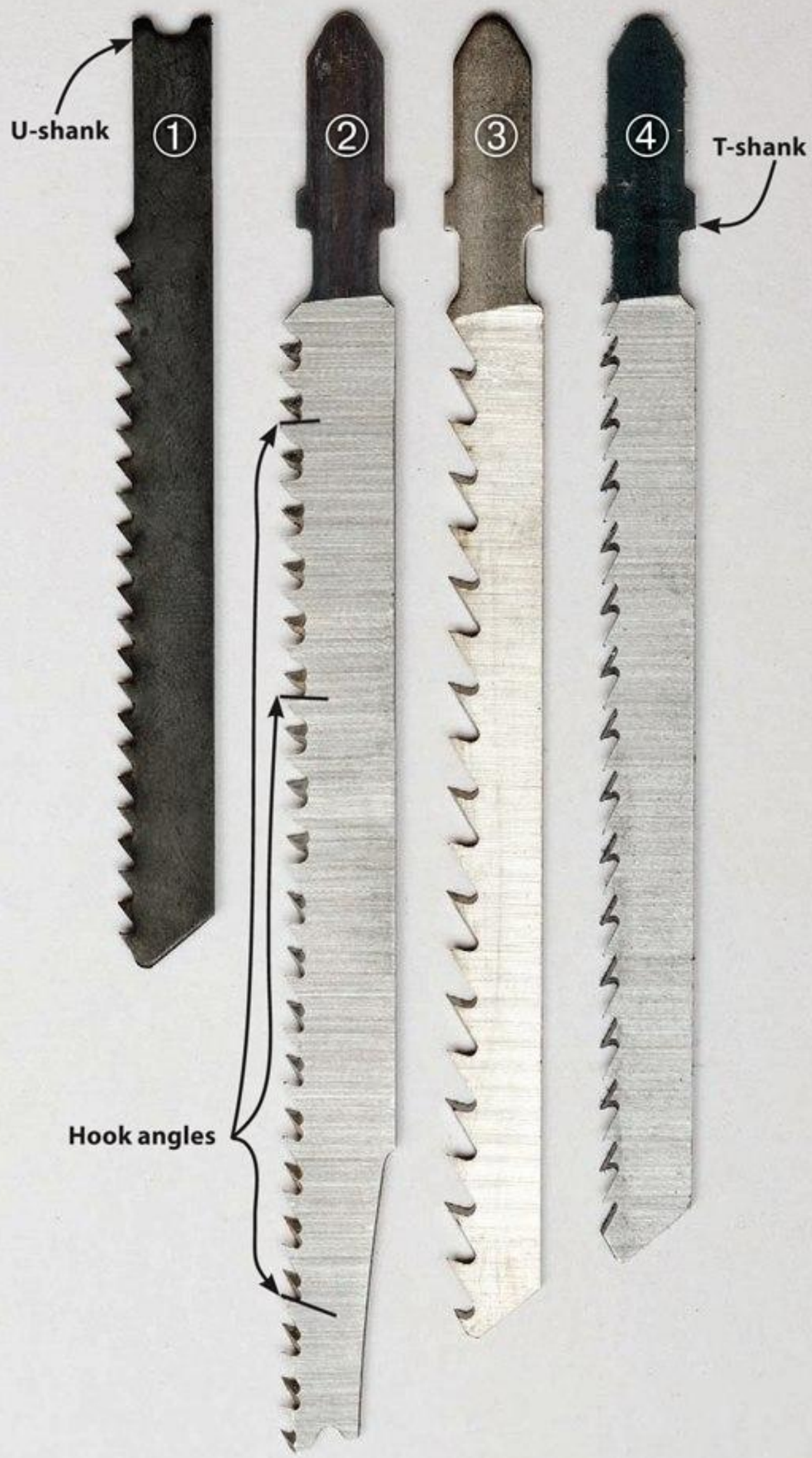
Blades with a set in the teeth tear at the wood rather than slice it cleanly.

A jigsaw blade with ground, inline teeth cuts a smooth kerf the same thickness as the blade body.

This crosscut was made with a 12-tpi blade featuring a traditional set in the teeth. Be prepared to sand!

This crosscut, made with a new 12-tpi blade with ground teeth, requires almost no cleanup. (We rubbed chalk on them to reveal blade marks.)

CHOOSE YOUR BLADE WISELY



①—U-shank blades tend to wobble, flex more, and produce more tear-out than T-shank blades. If you own a jigsaw that uses these blades, unfortunately, you have fewer options in blade choices. Opt for higher tooth counts as much as possible to reduce tear-out.

②—Progressive-tooth blades have a greater hook angle near the tip, putting those aggressive teeth where they're needed for fast cutting in materials thicker than 1". Less-aggressive teeth close to the shank end help the blade cleanly exit the top surface of the workpiece.

③—Standard 6-tpi blades use steep hook angles on the teeth and large gullets between them for quick waste removal. These blades work best when speed is more important than cut quality, such as working with construction lumber.

④—Reverse-tooth blades cut on the downstroke, minimizing chip-out on the face side of a workpiece when you must put the best face up during cuts. Making a sink cutout in a countertop calls for one of these blades.

advice: Practice on scrap of the same species to find the best combination of speed and feed rate.

Finally, remember that jigsaw blades cost a fraction of the material you're cutting. So know when to call it quits on a blade. If a blade begins to burn the wood or tear out surface fibers where it didn't used to, or if it requires greater effort to push through a cut, chuck it and get a new one.

Now set up the jigsaw for continued success

For softwoods, softer hardwoods (poplar, mahogany, alder, etc.), and sheet goods, run your jigsaw at its highest speed for most cuts. If you encounter resistance, back off the speed slightly. Dense hardwoods, such as cherry, maple, oak, and walnut, call for a slower blade speed to avoid burning. Use the slowest speed setting for cutting plastics and metals.

If your jigsaw has an orbital setting—an internal action that rocks the blade in a pendulum-like motion while simultaneously stroking up and down—set it to the greatest orbit for fast, but rough, cutting. Turn off the orbital action for cutting curves with less than a 3" radius. But if you're cutting large, sweeping curves, a little orbital action helps.

You also can reduce top-face workpiece tear-out by adding a zero-clearance shoe, such as the one shown at *right*, to your jigsaw. Make it from ¼" hardboard and secure it to the saw's foot with machine screws or double-faced tape. Ease the corners and edges with sandpaper to prevent making any scratches on your workpieces.

TIGHTER SHOE = CLEANER CUTS

Cut a V-notch in the shoe to just in front of the blade. This opens your sight lines while maintaining anti-chip-out protection.

Step-by-Step Elegant Chair

PROJECT HIGHLIGHTS

- Overall dimensions: 20"W×20¼"D×40⅛"H
- Built from solid cherry with a clear oil finish.
- Cost of materials (per chair): $125 for wood, $40 for seat materials.

Combining elements from Federal, Chippendale, Arts & Crafts, and Early American styles, furnituremaker Tom McLaughlin designed this chair for *WOOD*® magazine readers to be elegant without sacrificing comfort. Templates help you easily make the curved parts, and Tom does all the joinery on three machines: tablesaw, bandsaw, and mortiser (or drill press). When it's all done, fashion a comfy seat using our proven, easy-to-do technique.

Think before you cut

Because of a chair's complexity, it pays to be organized when machining and fitting parts. Tom suggests these tips:

- Machine setup proves critical in creating precise-fitting mortise-and-tenon joints—particularly the angled ones—so make 2 or 3 test pieces of each chair part. This helps you fine-tune setups before machining your final parts.
- If you make more than one chair, mill each part for all chairs at the same time to avoid repeating machine setups.
- Label all the parts to group them together by chair. This way, once you've fitted all the joints and made color matches, they'll be easy to pair up again for assembly.
- Save the cutoffs from curved and beveled project parts of one chair. You'll use them later to help clamp these parts for mortising and final shaping.

About the chair's builder

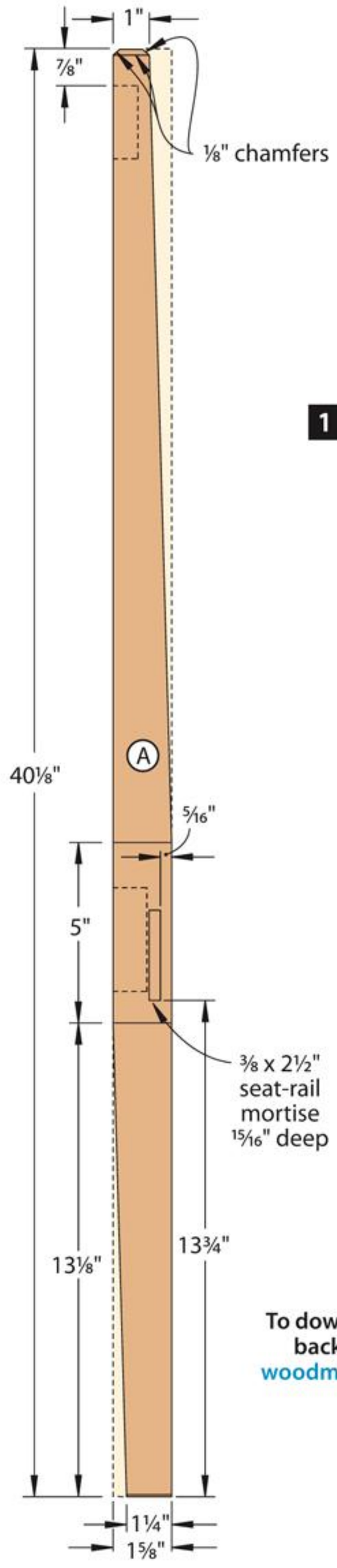
Tom McLaughlin started his professional woodworking career in eastern North Carolina, learning to make furniture from P.A. "Pug" Moore, a renowned craftsman of 18th-century reproductions. By his mid-30s, Tom had settled in the rolling hills north of Concord, N.H. These days, he teaches about 12 woodworking classes a year at McLaughlin Woods, his 3,600-square-foot, three-level shop built into a hillside, shaded by maples, birches, and oaks. (For information about the school, go to mclaughlinwoods.com or call 603-783-9700. To view a slideshow of Tom's other furniture projects, go to woodmagazine.com/mclaughlin.)

Tom loves to design and build chairs more than anything else. "The challenge of trying to make them comfortable and appealing from all vantage points is what really drives me," he explains. Tom has designed more than 20 chairs, earning numerous design awards.

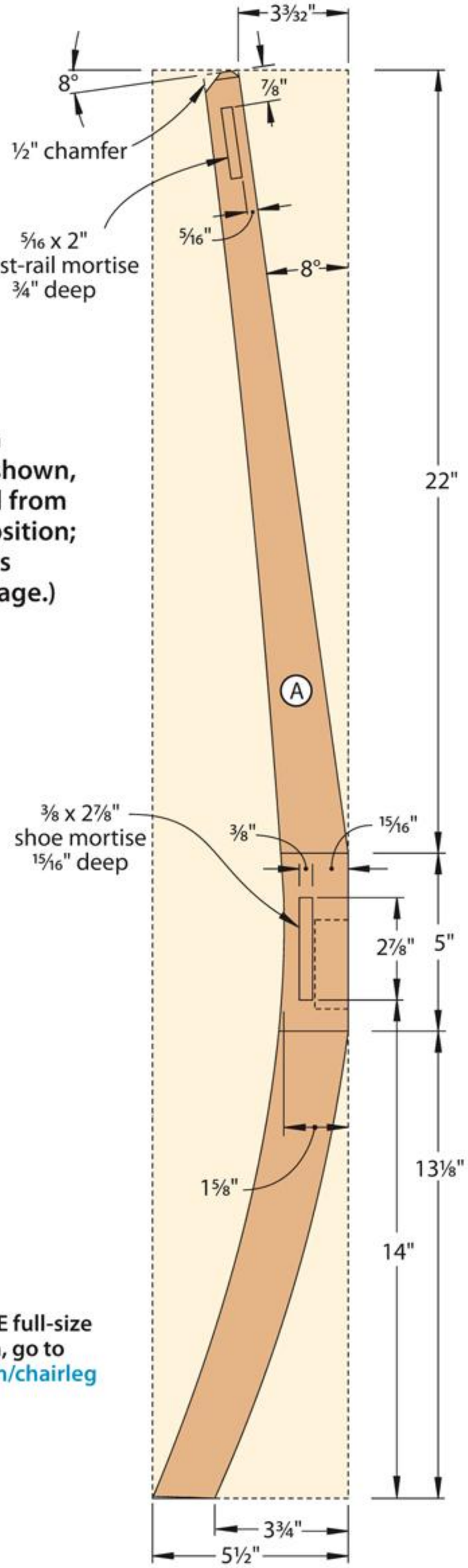
Cut the legs to shape

1 Using the pattern in the *WOOD Patterns*® insert, draw the back leg (A) [**Drawing 1**] pattern at full size. Make a template of that pattern from ¼" hardboard and lay out the mortise locations on it. Trace the template on a 1⅝"-thick leg blank and bandsaw to within 1/16" of the lines. Repeat for the other back leg.

1 BACK LEG
(Left leg shown, as viewed from seated position; right leg is mirror image.)



FRONT VIEW



INSIDE FACE

To download a FREE full-size back-leg pattern, go to woodmagazine.com/chairleg

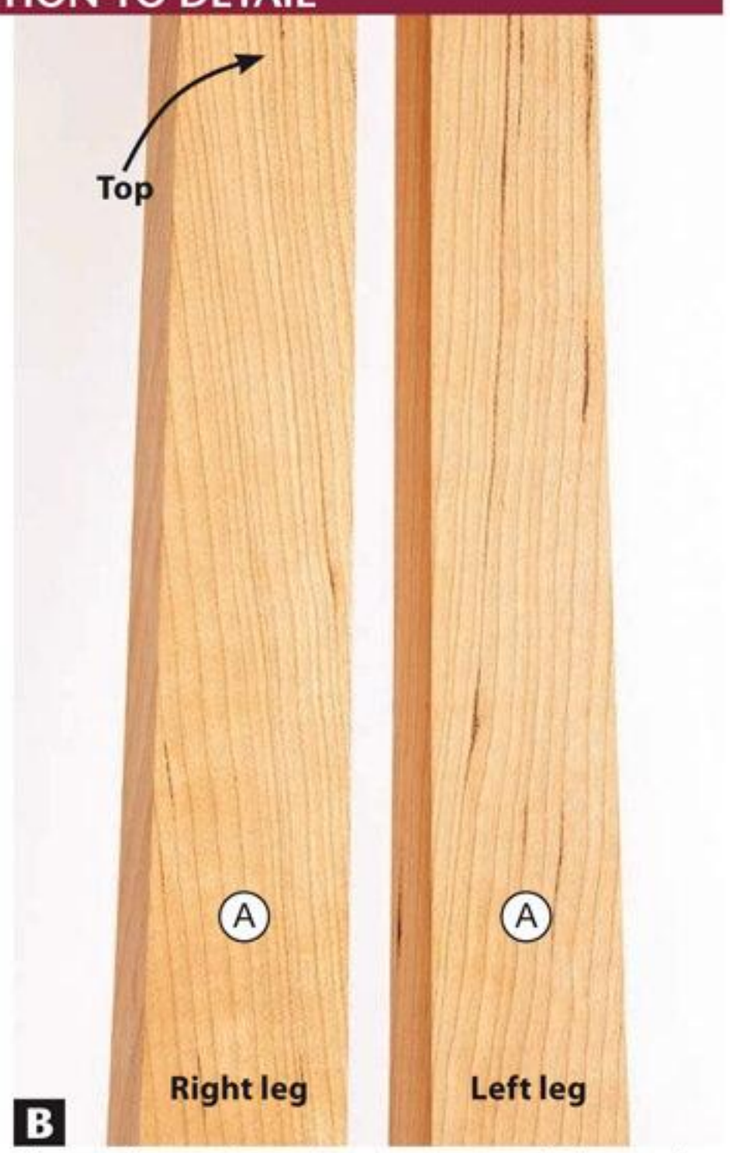
Tom's Tip! For the best appearance, you want the grain direction on the front face of each back leg to be mirror images. To ensure that, when you lay out the legs, flip your pattern end for end [**Photo A**]. Then nest multiple legs like spoons. This will ensure you have mirror-image right- and left-leaning-grain legs [**Photo B**].

2 Mount the template to a bandsawn leg with double-faced tape. Install a 2" flush-trim bit in your table-mounted router, set the height so the bearing runs against the template, and trim the back legs' edges to shape. Mark the top and bottom of each leg with a pencil, remove the template, and sand the legs to the marked lines.

3 Cut the front legs (B) to size [**Materials List**, **Drawing 2**], and mark the front faces. Tilt your tablesaw blade to 7° and bevel-rip the outer face of each leg—making the front face wider than the rear face. From scrap stock, rip two wedges, each about 10–12" long, with the same bevel; you'll need these when making the mortises in the legs.

GRAIN ANGLE REVEALS YOUR ATTENTION TO DETAIL

When you flip the leg template, keep the same ends together. Lay out multiple chair legs nested against the first pair.

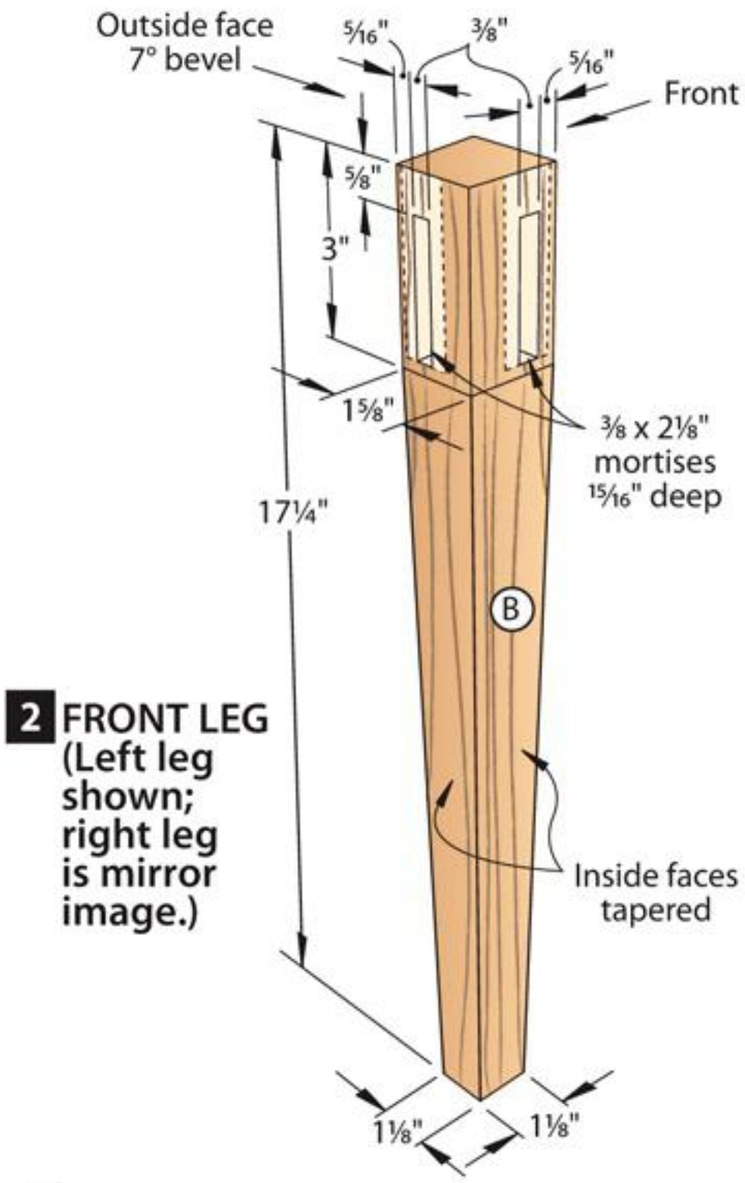


The grain on these legs runs at a slight angle across the board's thickness. Pair legs so the grain direction is symmetrical for best appeal.

Size up the seat back

1 Cut the shoe (C) to size [**Drawing 4**], but do not cut the top-side bevels yet. Lay out the four mortises as shown.

2 Cut the crest rail (D) to size [**Drawing 5**] but ⅜" longer than its final length. Make two copies of the **Crest Rail Pattern**, located in the *WOOD Patterns®* insert. Adhere one pattern to the bottom edge, but don't cut the curves yet.



2 FRONT LEG (Left leg shown; right leg is mirror image.)

3 For the splat (E) and spokes (F), machine a single ½×7×21" blank [**Drawing 6**]. You'll rip the spokes away later after cutting the tenons.

Make all the mortises

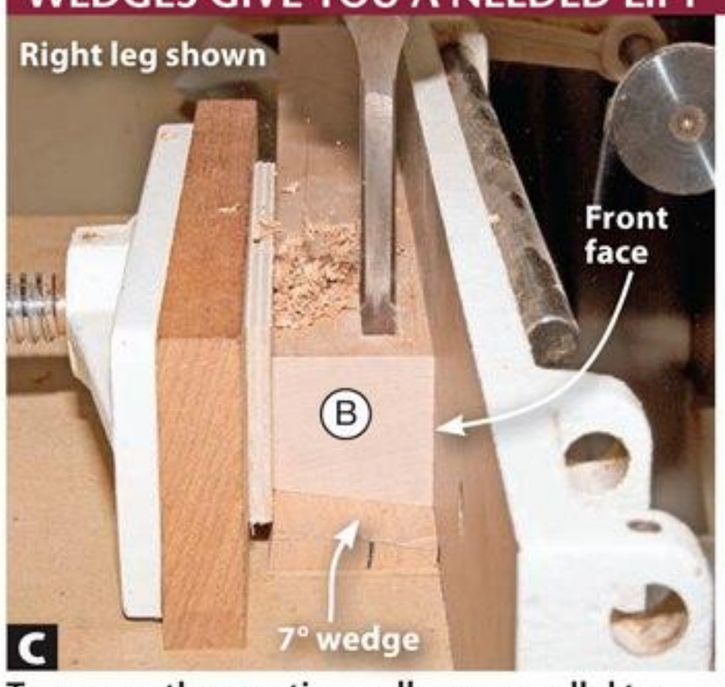
1 Lay out mortise locations on the legs (A,B) where shown in **Drawings 1 and 2**, remembering to make mirrored left and right versions.

2 Cut the ⅜" mortise to accept the front seat rail (G) [**Photo C, Drawing 2**] in the front legs (B). Rotate the front leg (B) so the beveled edge rests against the mortiser or drill press fence [**Photo D**], and then cut the angled ⅜" mortise for the side seat rail (H). Repeat for the other front leg.

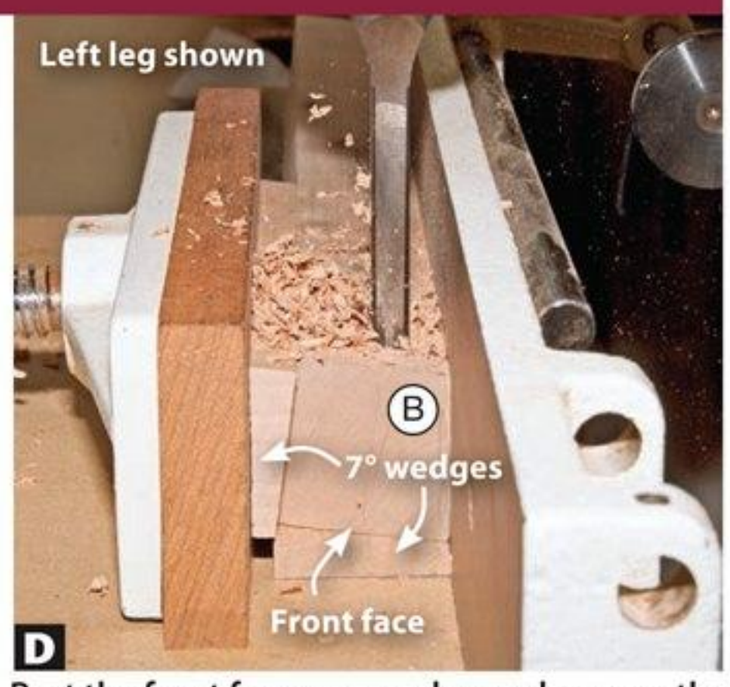
3 If you did not have a large enough scrap cutoff from your back-leg blank, make a curved support block [**Photo E**] from scrap as thick as or a little thinner than the leg and measuring about 3½×20". This will hold the leg at the correct angle for cutting the side seat-rail mortise.

4 With the curved block supporting the back leg (A) [**Photo F**], cut the ⅜" mortise for the side seat rail (H). Repeat for the other back leg.

WEDGES GIVE YOU A NEEDED LIFT



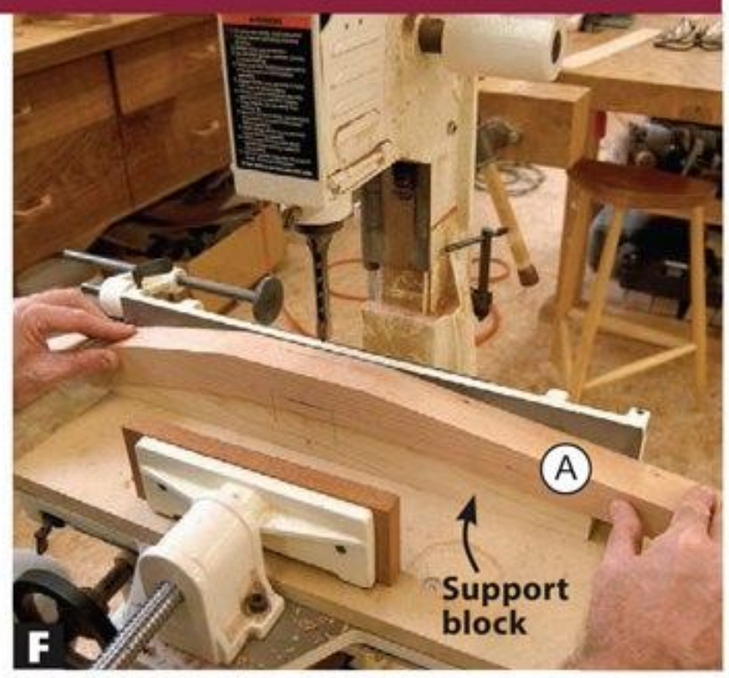
To ensure the mortise walls run parallel to the leg's front face, support the leg, beveled edge down, with a 7° wedge, cut from scrap.



Rest the front face on a wedge and use another to clamp the leg securely. (Skip the second wedge if your mortiser lacks this clamp.)

MAKE A QUICK ARCH SUPPORT

Transfer the end marks for the side seat-rail mortise onto a scrap blank, trace the curve, and then bandsaw it to shape.



Line up the support-block mortise marks with those on the leg. If the leg touches the mortiser table it will alter the mortise angle.

5 To make the ⅜" mortises in the back legs (A) to fit the shoe (C), hold the leg's flat face—where you just cut the previous mortise—against the fence and make the cut on the inside faces.

6 Cut the 5/16" crest-rail (D) mortise on the inside top of each back leg (A), holding the front face against the fence.

7 Make the ¼" mortises in the shoe (C) [**Drawing 4**] for the splat (E) and spokes (F).

8 Cut the ¼" splat (E) mortises on the bottom of the crest rail (D) [**Drawing 5**]. For the spoke (F) mortises, insert a 4° wedge between the crest rail (D) and fence, as you did in **Step 2**.

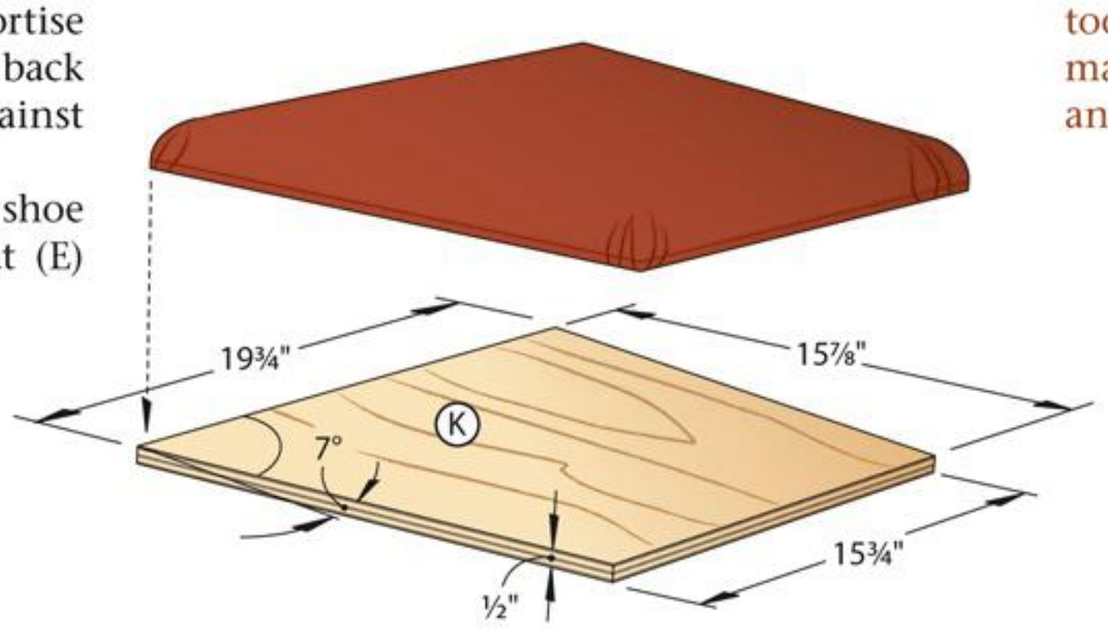
Now for the tenons

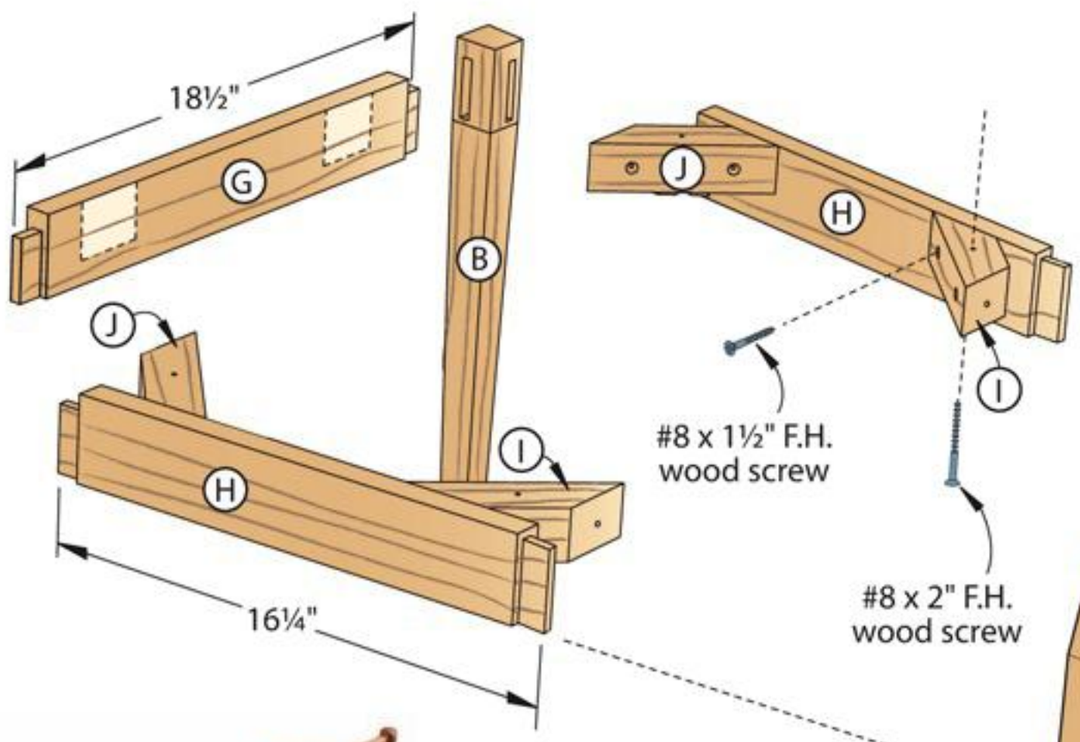
1 Make the tenoning jig shown in the **Quick & Easy Jig** on *page 28*.

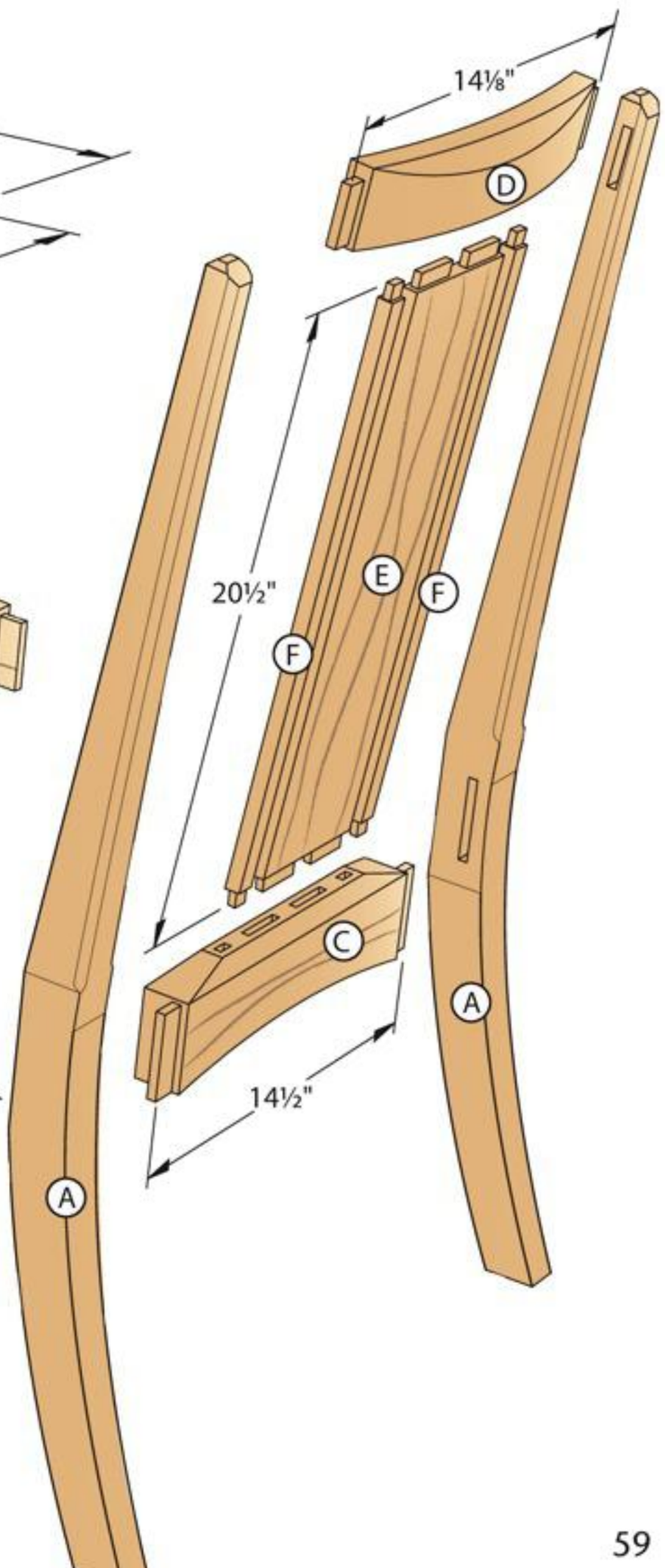
2 Make three spacers from scrap stock in ¼", 5/16", and ⅜" thicknesses—plus the thickness of your blade—about 3" to 4" wide to cut the three tenon sizes.

3 Cut the front (G) and side (H) seat rails to size [**Drawing 7**]. Holding or clamping the corresponding spacers between the jig and your project parts [**Photo G**], cut the 90° tenon cheeks on the front seat rail (G), side seat rails (H, front tenons only), shoe (C), crest rail (D), and splat/spoke (E/F) blank [**Drawings 4, 5, 6, 7**]. (Although the crest-rail tenons ultimately will be cut down to 11/16" long, make them ⅞" for now to avoid making a separate setup at the tablesaw.)

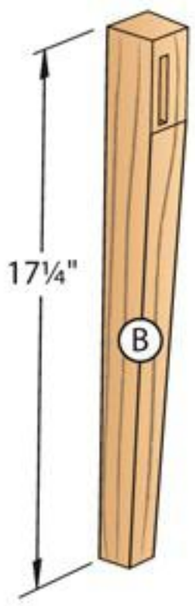
Tom's Tip! After making the tenon cheek cuts on scrap stock, remove most of the waste material at the bandsaw—but stay back ¼" from the shoulders. Removing this waste prevents the cutoff from being trapped between the tablesaw blade and rip fence. Check the test tenon's fit in its mortise. If the tenon fits too loosely, add a strip or two of masking tape to the spacer and cut another test tenon.

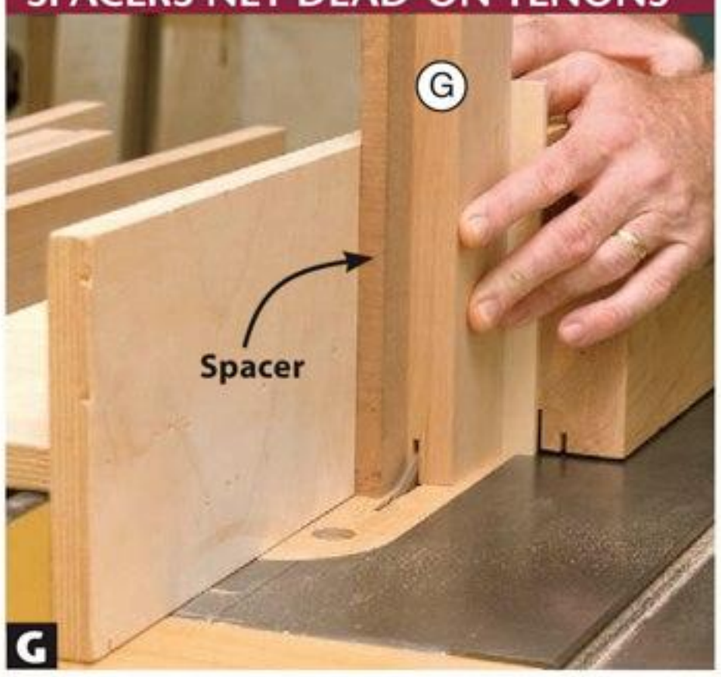




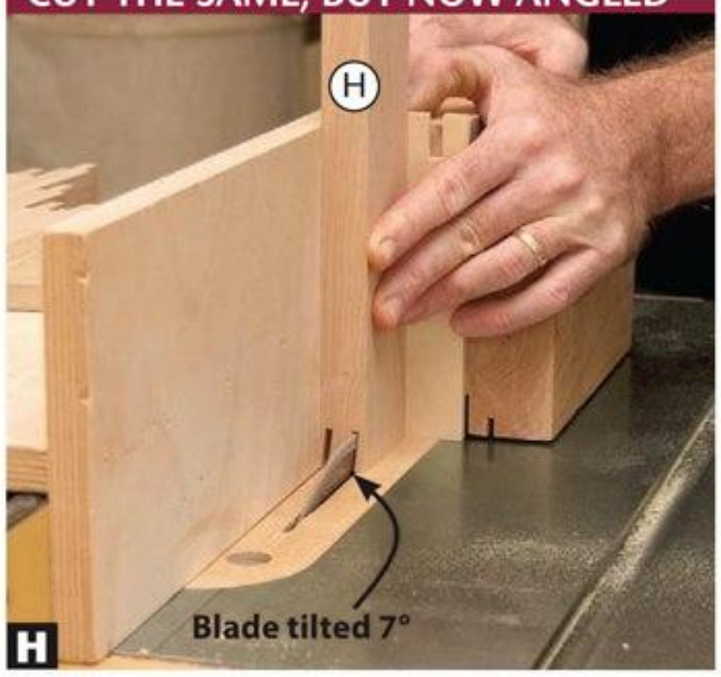


3 EXPLODED VIEW





For the ⅜" tenons on the seat rails (G,H), insert that size spacer to make the first cut. Remove the spacer for the second cut.



Using the same setup as before—but with the blade tilted 7°—hold the rail's outer face against the jig and cut the tenon cheeks.

4 Using an extension secured to your miter gauge for support, crosscut the 90° tenon shoulders on the shoe (C), crest rail (D), splat/spoke blank (E/F), and front seat rail (G).

5 Tilt the blade 7° from vertical. Cut the ⅜" angled tenon cheeks on the rear of the side seat rails (H) [**Photo H**].

6 With the blade still at 7°, cut angled shoulders on the side seat rails' (H) front and rear tenons [**Photos I, J, K**].

7 Increase the blade angle to 8°. Now cut the ¼" angled tenons and shoulders on the bottom of the splat/spoke blank (E/F) [**Drawing 6a**] as you did in **Steps 5 and 6**. Reset the blade to 90° and rip a spoke (F) from each edge of the splat/spoke blank. Notch the center of each splat (E) tenon [**Drawing 6**] with a coping saw and chisel (see the **Shop Tip** *below*, to learn how), and remove a ¼" notch from each edge.

8 Cut the top shoulders into the front and side seat-rail tenons (G, H) [**Drawing 7**]. Crosscut 3/16" off the end of each crest-rail (D) tenon.

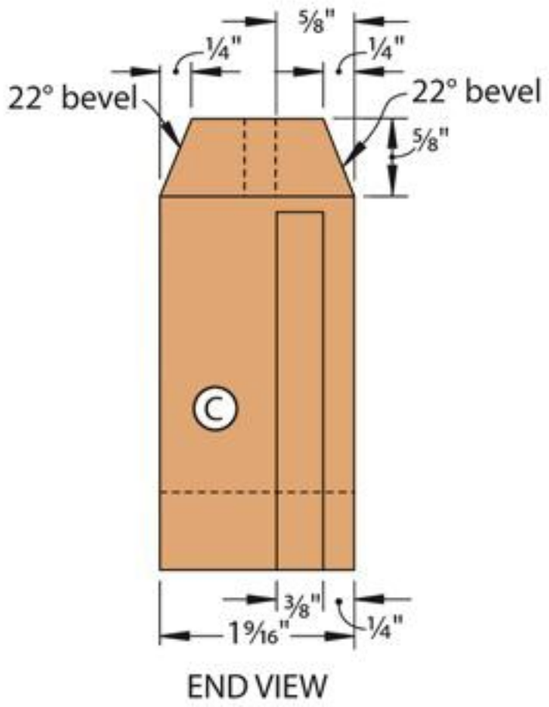
9 Dry-fit the chair, lightly trimming any tight-fitting tenons with a shoulder plane or file. Fit the splat and spokes into the shoe and crest-rail mortises first, and then fit the shoe and crest rail into the back legs. Next, fit the seat rails into the legs. Disassemble when all parts fit.

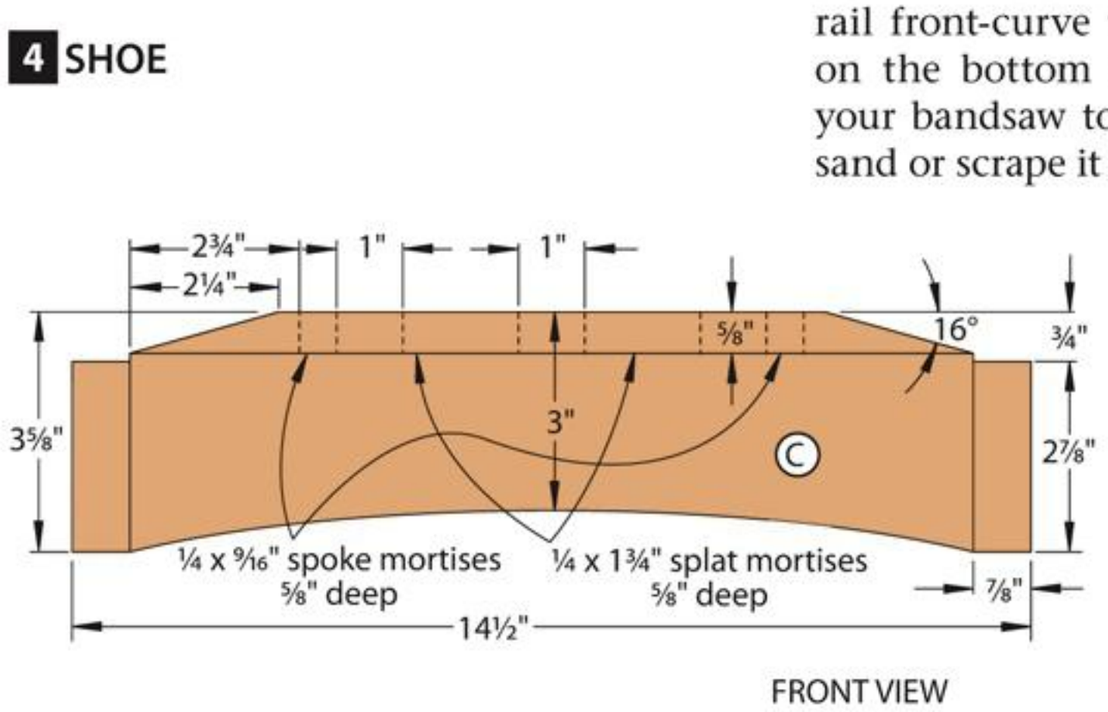
Shape all curves and tapers

1 Cut the crest rail (D) front and rear curved faces on the bandsaw, and then sand or scrape them smooth.

2 Use the remaining **Crest-Rail Pattern** to make a ¼" hardboard template of the front curve. Use this template to draw the beveled curve on the top and back of the crest rail (D). Mark a curve on the top edge that parallels the front curve [**Photo L**]. Tilt your bandsaw table to 27° and cut along both lines. Sand or scrape the curves smooth.

3 Lay out and bandsaw the 16° end bevels on the shoe (C) [**Drawing 4**]. Now tilt your tablesaw blade to 22° and rip the side bevels. Smooth all four bevels with a block plane. Using the crest rail front-curve template, mark the arc on the bottom edge of the shoe. Use your bandsaw to cut the arc, and then sand or scrape it smooth.

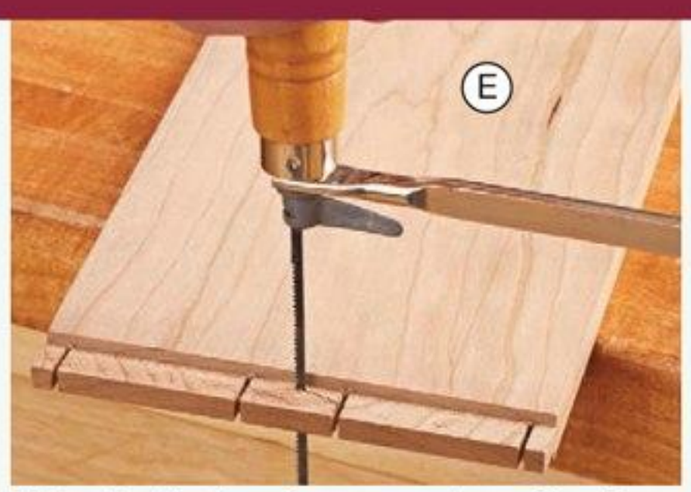




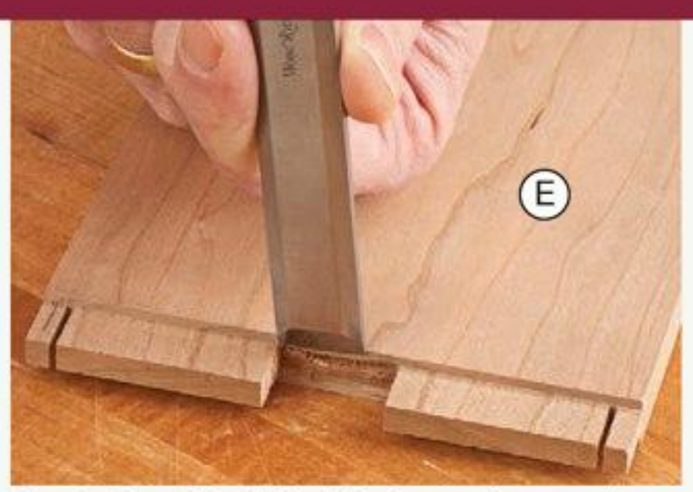
SHOP TIP

Hone your hand-tool skills for a flush splat fit

Cutting out the notch in the middle of the splat tenons can be a challenge to do with only power tools. Your best bet: Make the dividing cuts up to the shoulder at your bandsaw or with a sharp backsaw. Then use a coping saw, which pivots sharply in this tight area, to cut out the waste within 1/16" of the shoulder. Finally, with a chisel, pare the rest away flush with the shoulders.



Make the first coping-saw cut angling from one kerf to the back corner of the other. Then saw out the remaining waste.



Angle the chisel slightly inward so you're back-cutting. This will ensure a tight fit at the joint line.

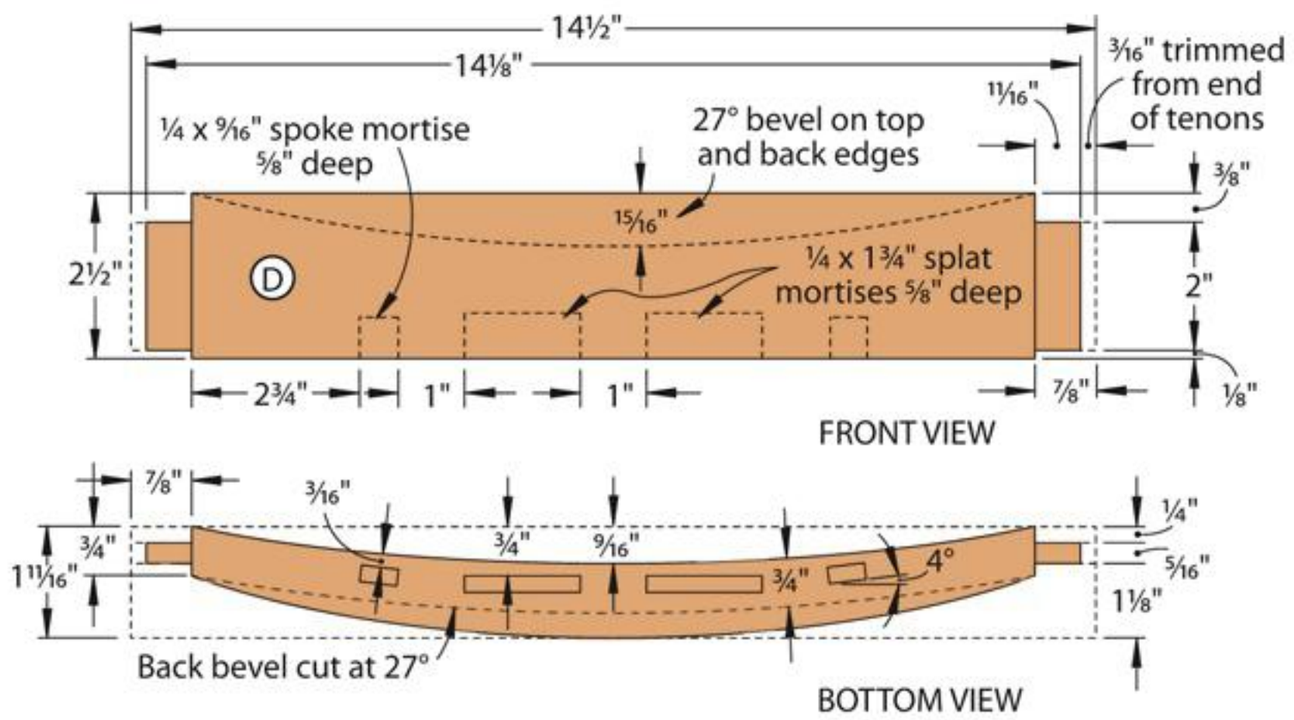
CUT PRECISE ANGLED TENON SHOULDERS

Make the first shoulder cut so the blade just kisses the tenon cheek. Use a sliding bevel gauge and marking knife to transfer the 7° angle of the shoulder to the spot where the second shoulder will be. Finally, switch to the other side of the blade and cut the second shoulder to that line.

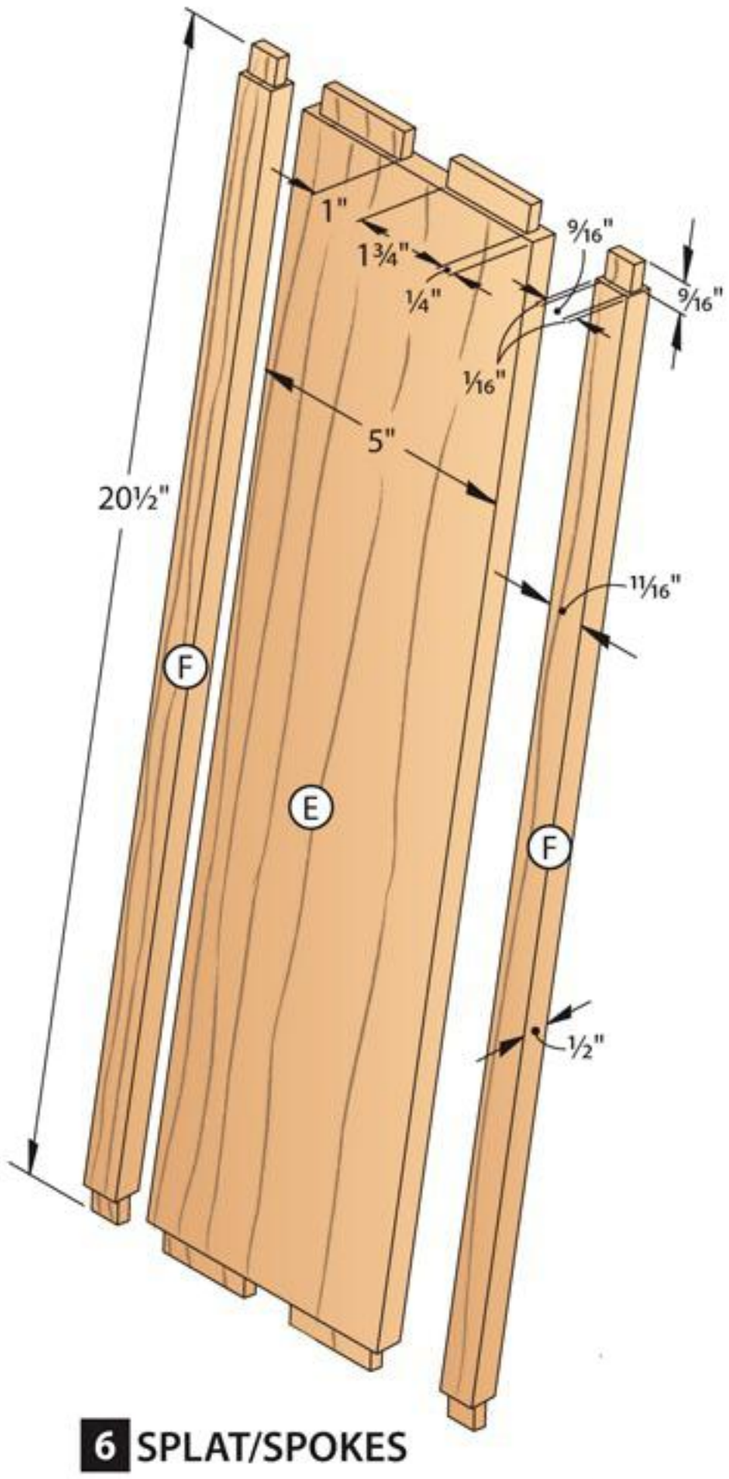
4 At the bandsaw, cut the tapers on the back (A) and front (B) legs [**Drawings 1 and 2**]. Sand or plane the tapers smooth.

5 Make marks on the back face of the rear legs (A) at 7", 18½", and 21" from the top. With a 45° chamfering bit in your router, rout progressively deeper

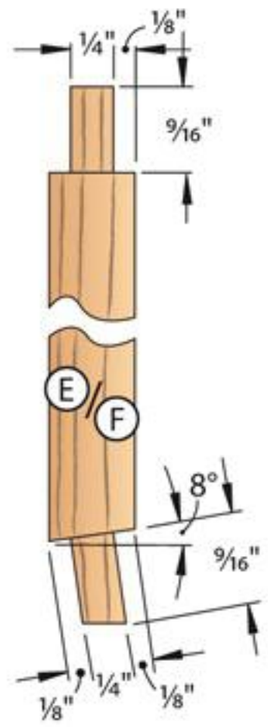
5 CREST RAIL



Full-size in WOOD Patterns® Insert on *Page 46*

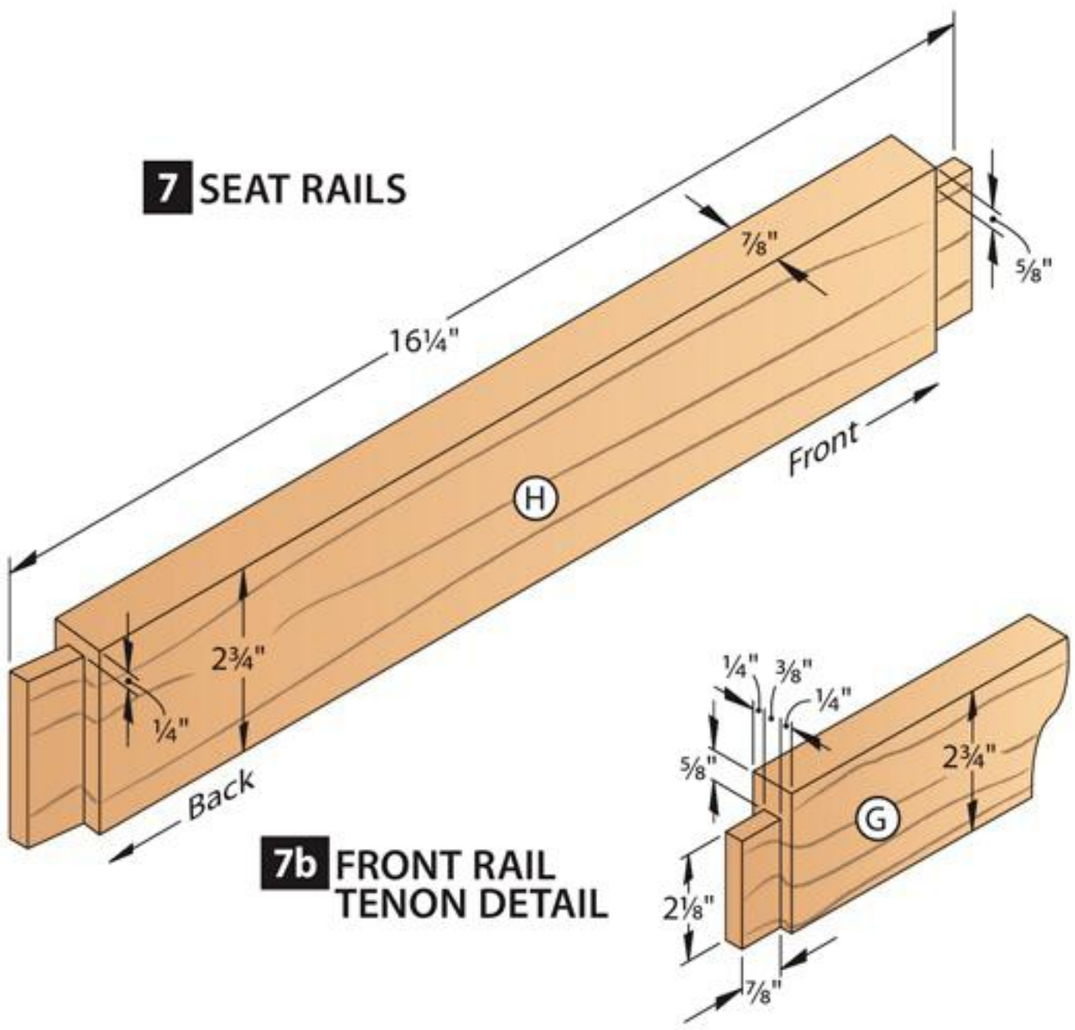


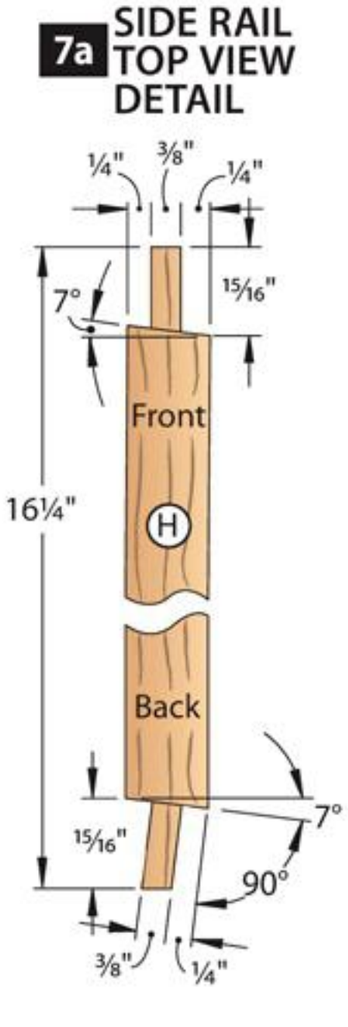
6 SPLAT/SPOKES



6a SPLAT/SPOKES DETAIL

SIDE VIEW





Use three fingers to guide your hand along the crest rail front face, giving you a scribed line parallel to the top front edge.

Rout the chamfers to make three tiers. Then use a block plane and scraper to blend the transitions between chamfer depths.

chamfers (for both edges of each leg): ¼" deep from the top to the 21" stop mark; 5/16" deep from the 7" mark to the 21" stop; and 7/16" deep from the 18½" mark to the last stop [**Photo M**].

At the 21" mark, use a rounded rasp to shape and extend (by about 1") a scooped curve from the chamfer stopping point.

Note: *At the top of the leg, the chamfers and center flat should be of equal width. Be sure to avoid cutting the chamfer deeper than the shoulder line of the crest rail.*

6 Use a block plane to make slight chamfers around the bottoms of all legs (A, B). At the top of the back legs (A), plane ⅛" chamfers around the front and sides [**Drawing 1**]. Plane a ½" chamfer on the rear from the top.

7 Scrape or sand all parts smooth, including a final sanding to 220 grit.

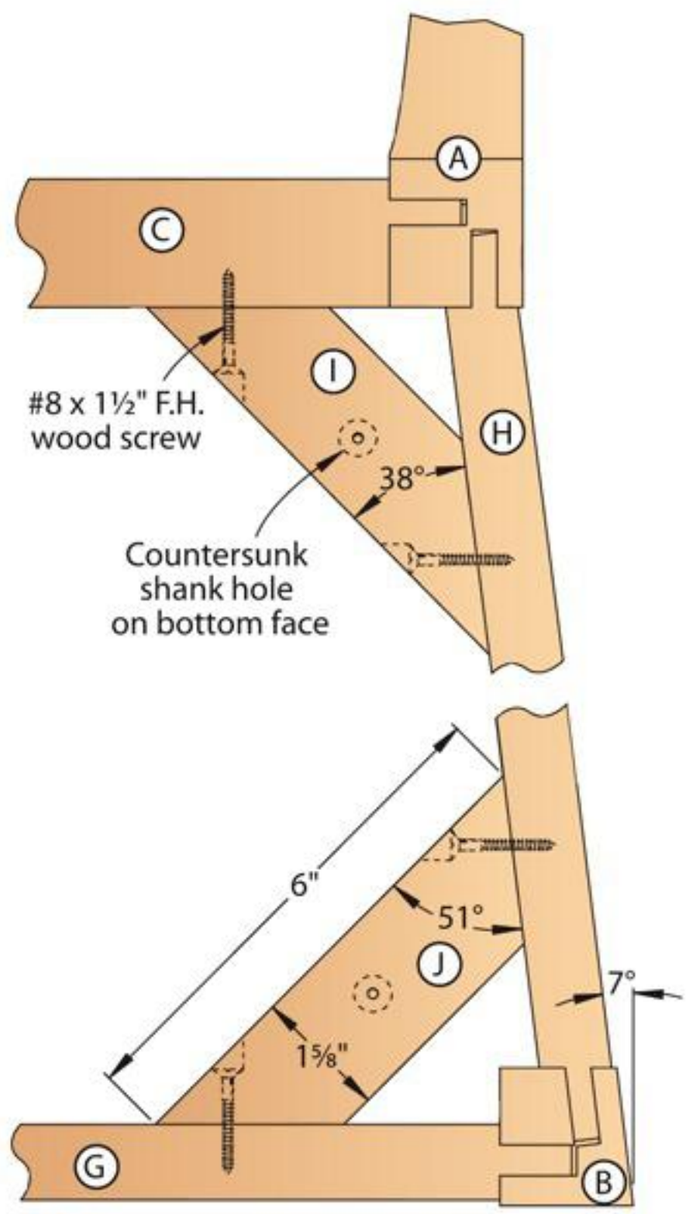
Tom's Tip! Wet all parts to raise the grain prior to your 220 sanding. This eliminates grain-raising when you wipe away glue squeeze-out with a damp rag. That helps you avoid the difficult sanding afterward between and around joined parts.

Finally, assemble and finish

1 Glue the splat (E) and spokes (F) into the crest rail (D) and shoe (C). Then glue and clamp that assembly between the back legs (A). Glue the front seat rail (G) into the front legs (B). When these assemblies have dried, glue the side seat rails (H) into the front (B) and rear (A) legs and clamp securely.

2 Cut the front and rear braces (I, J) [**Drawing 8**] and install them with glue and screws to strengthen the chair's frame and provide a mounting surface for the seat.

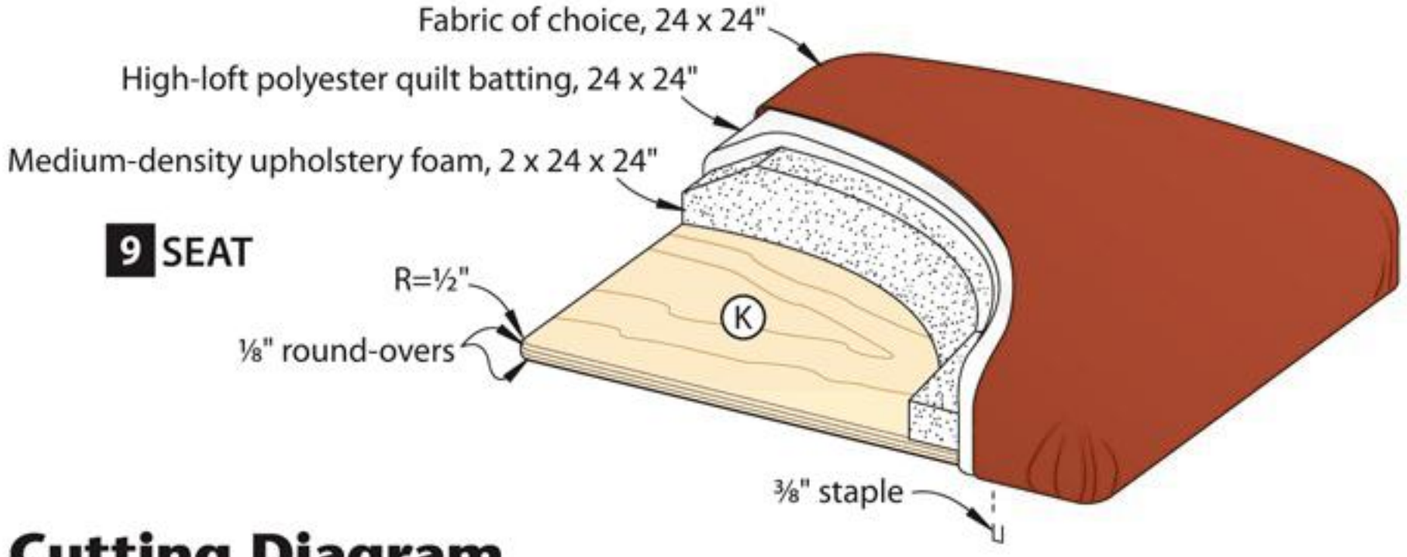
3 Apply your finish of choice. (Tom recommends three coats of Watco Danish Oil or any wiping varnish.)



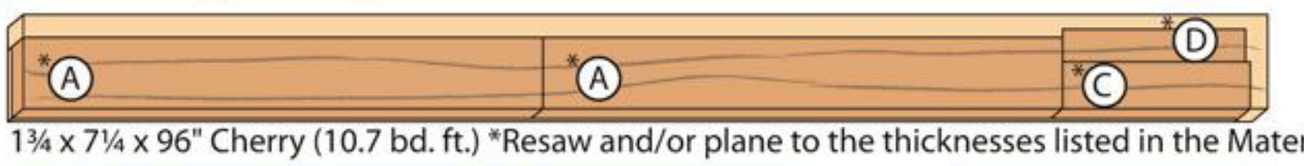
8 SEAT FRAME ASSEMBLY

4 Build and upholster the seat (K) [**Drawings 3 and 9**]. For a free downloadable technique on easy upholstery, go to woodmagazine.com/upholster. When finished, attach this seat to the chair braces (I, J) with #8×2" screws.

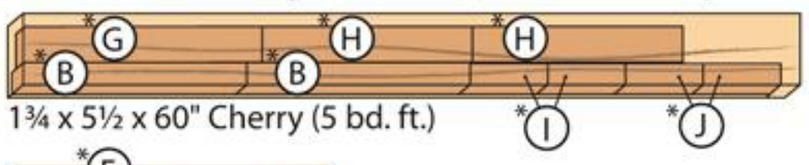
Produced by **Bob Hunter** with **Tom McLaughlin**
Illustrations: **Roxanne LeMoine; Lorna Johnson**
Opening photo and portrait: **Ken Williams**



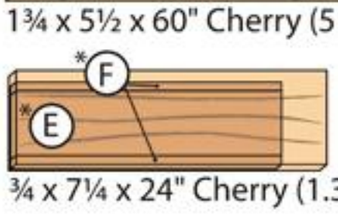
Cutting Diagram



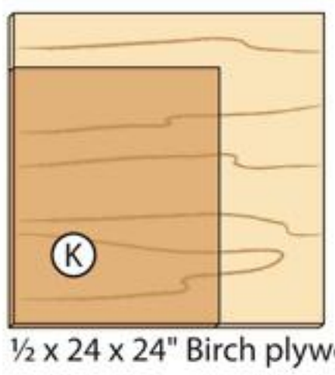
1¾ x 7¼ x 96" Cherry (10.7 bd. ft.) *Resaw and/or plane to the thicknesses listed in the Materials List.



1¾ x 5½ x 60" Cherry (5 bd. ft.)



¾ x 7¼ x 24" Cherry (1.3 bd. ft.)



½ x 24 x 24" Birch plywood

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	back legs	1⅝"	5½"	40⅛"	C	2
B	front legs	1⅝"	1⅝"	17¼"	C	2
C	shoe	1 9/16"	3⅝"	14½"	C	1
D*	crest rail	1 11/16"	2½"	14⅛"	C	1
E*	splat	½"	5"	20½"	C	1
F*	spokes	½"	1 1/16"	20½"	C	2
G	front seat rail	⅞"	2¾"	18½"	C	1
H	side seat rails	⅞"	2¾"	16¼"	C	2
I	rear braces	1⅝"	1⅝"	6"	C	2
J	front braces	1⅝"	1⅝"	6"	C	2
K	seat	½"	19¾"	15⅞"	BP	1

*Parts initially cut oversize. See the instructions.

Materials key: C–cherry; BP–birch plywood.
Supplies: Double-faced tape, spray adhesive, #8×1½" flathead wood screws (8), #8×2" flathead wood screws (4), medium-density upholstery foam, high-loft polyester quilt batting, fabric for seat, ⅜" upholstery staples.
Router bits: ⅛" round-over, 45° chamfer, 2" flush-trim.

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Tool tester Bob Saunders feeds an ash board through this bandsaw to test its resawing power and accuracy.

SHOP TESTED

Deluxe 14" Bandsaws

Ranging from $770 to $1,495, these saws give you greater power and resaw capability than entry-level models.

Choosing to purchase a 14" deluxe bandsaw says a lot about where you are in your woodworking journey. You're ready to move to a machine capable of tackling all curve-cutting, ripping, crosscutting, and resawing tasks in even the thickest and hardest wood species. Thankfully, you don't have to jump to a pricey 18" or larger bandsaw to get these attributes. This class of 14" bandsaws—measured by wheel diameter—does it all.

What to look for in a 14" bandsaw

■ **Ample resawing capacity.** Start your search by focusing on the widest board the saw can rip standing on edge. Get as much capacity as possible, because you'll never wish you had less. Having the ability to rip a wide board into thinner pieces opens up greater project options, such as bookmatched door panels or thin slabs laminated around a curved form. Resawing allows you to maximize the face (showing surface) of a prized piece of wood, such as spalted maple or quilted mahogany.

A one-piece steel frame—found on three of the bandsaws in this test—provides 10–14" of resaw capacity. On the other hand, three of the C-frame saws (Delta 28-206, Grizzly G0555X, and Powermatic PWBS-14CS)—which look like big cast-iron C-clamps on bases—resaw only 6" out of the crate. But if you install an optional riser block ($70–$120), shown *below left*, you'll double that capacity. Though a C-frame saw, the Jet JWBS-14DXPRO comes standard with 12" resaw capacity built into its column; no need for a riser block. The C-frame Powermatic includes the riser-block kit as standard equipment. (Watch a free video on installing a riser block at woodmagazine.com/riserblockvid.)

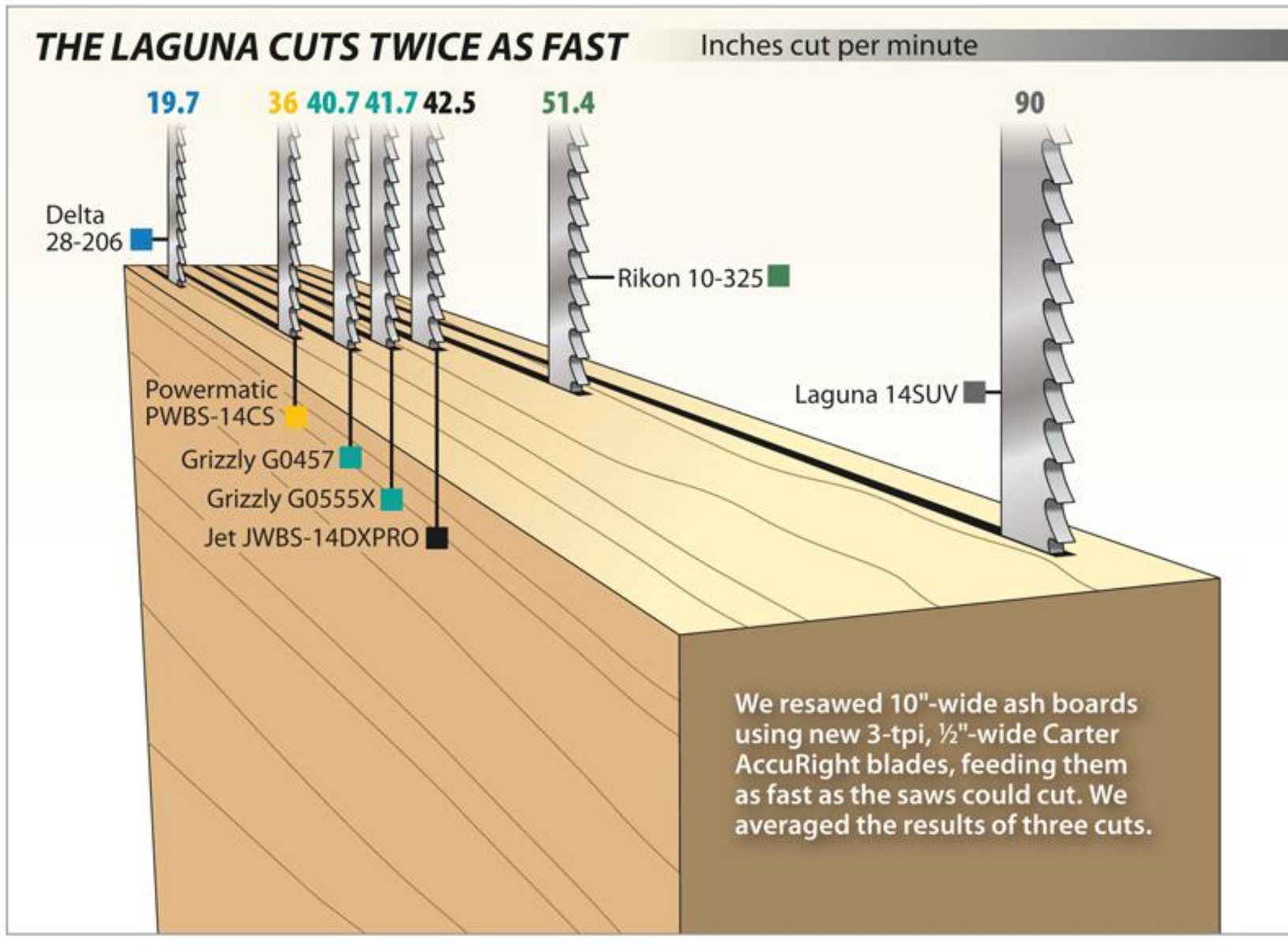
■ **Plenty of power.** Cutting curves or ripping stock up to 2" thick won't challenge the power of any 14" bandsaw. But when you resaw—especially hardwoods 10" or wider—you need power in spades. For this, look at two factors. First, the motor should be rated at least 1 hp, but go bigger if your budget and shop's electrical capacity can handle it. (Bandsaws powered by 110-volt motors top out at 1½ hp; anything greater requires a 220-volt circuit.) In our testing, the 3-hp Laguna 14SUV dominated the power showdown. (See the chart *below*.)

The second power factor: the wheels that drive the blade. Cast-iron wheels outperform aluminum ones because their greater weight generates more momentum to power the blade through a cut. This weight also dampens vibration, resulting in greater accuracy and cut quality. Of the tested saws, all but the Delta have cast-iron wheels.

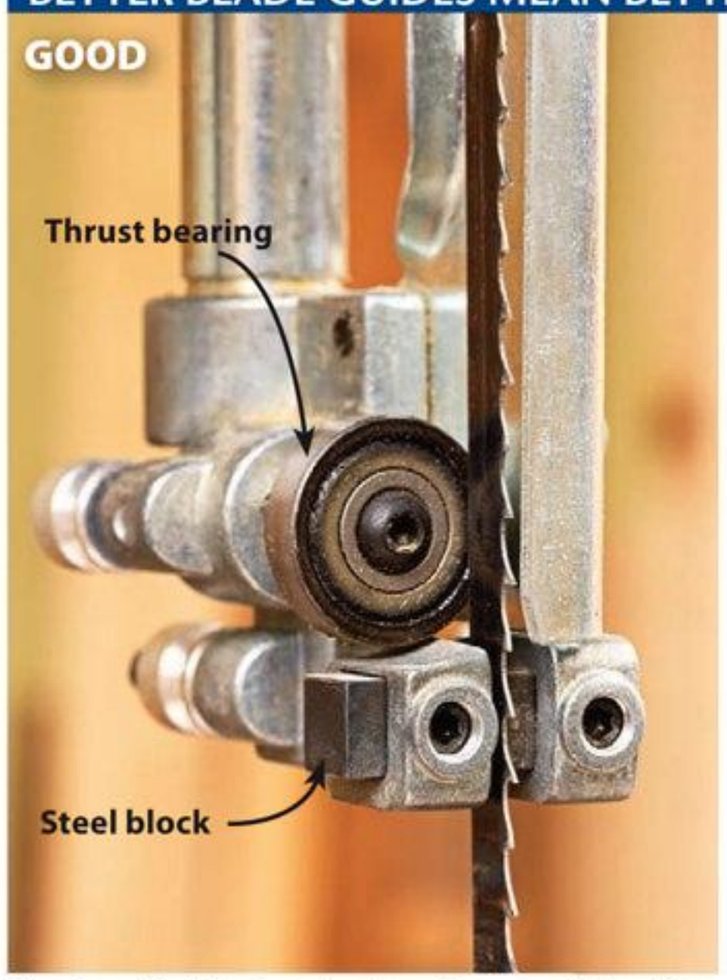
A MUCH-APPRECIATED HIGH-RISE

A riser-block kit comes with the block, a connecting bolt, and extended blade guards. It takes about 20 minutes to install.

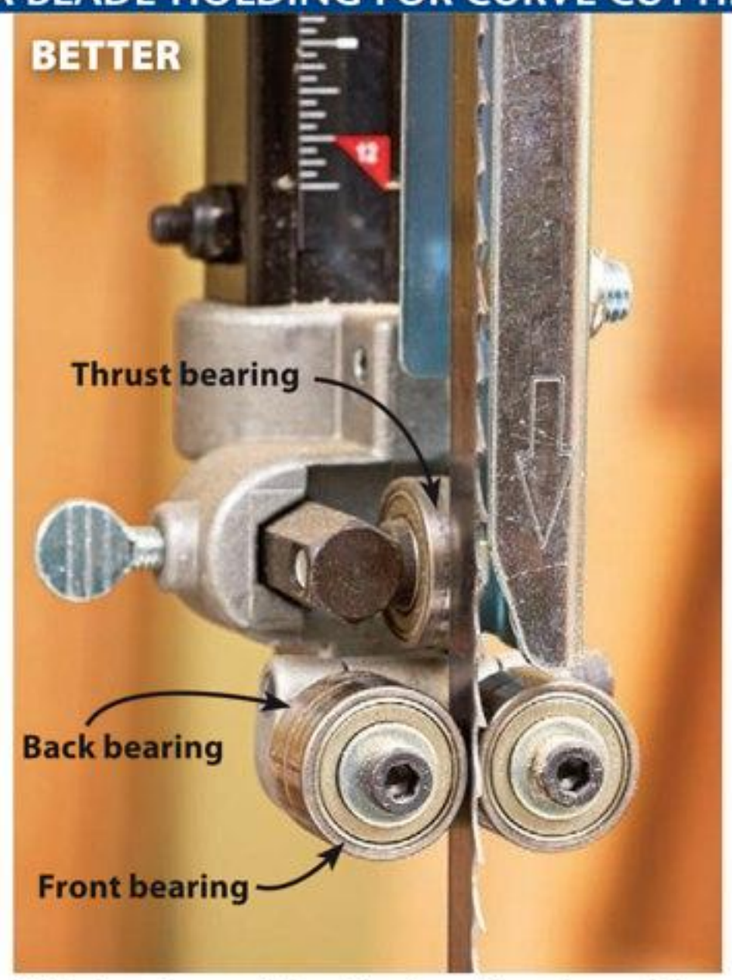
THE LAGUNA CUTS TWICE AS FAST Inches cut per minute



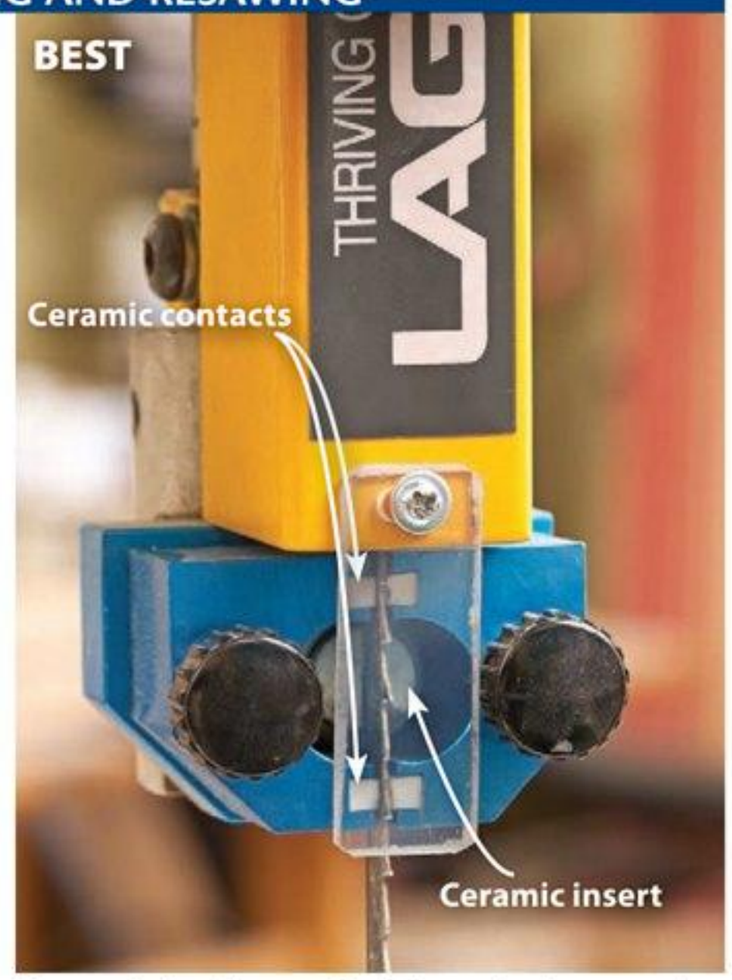
BETTER BLADE GUIDES MEAN BETTER BLADE-HOLDING FOR CURVE CUTTING AND RESAWING



Steel guide blocks sit a few thousandths of an inch from the blade. The thrust bearing snugs up behind the blade the same distance; the blade runs against the thrust bearing's face.



With bearing guides, the front bearings ride just behind the blade gullets. (Back bearings support only blades ½" or wider.) The blade edge runs against the thrust bearing's rim.



Four points of ceramic side contact prevent blade twisting better than bearings. Rather than a thrust bearing, this guide uses a ceramic insert.

■ **Quality blade guides.** A bandsaw with great power and cut capacities but lackluster blade guides is like a Mercedes without power steering. Adjustable blade guides mounted above and below the table prevent the blade from twisting or wandering side-to-side during cuts, greatly enhancing accuracy. The best guides prove easy to set and adjust, because you'll do this every time you change from one blade width to another.

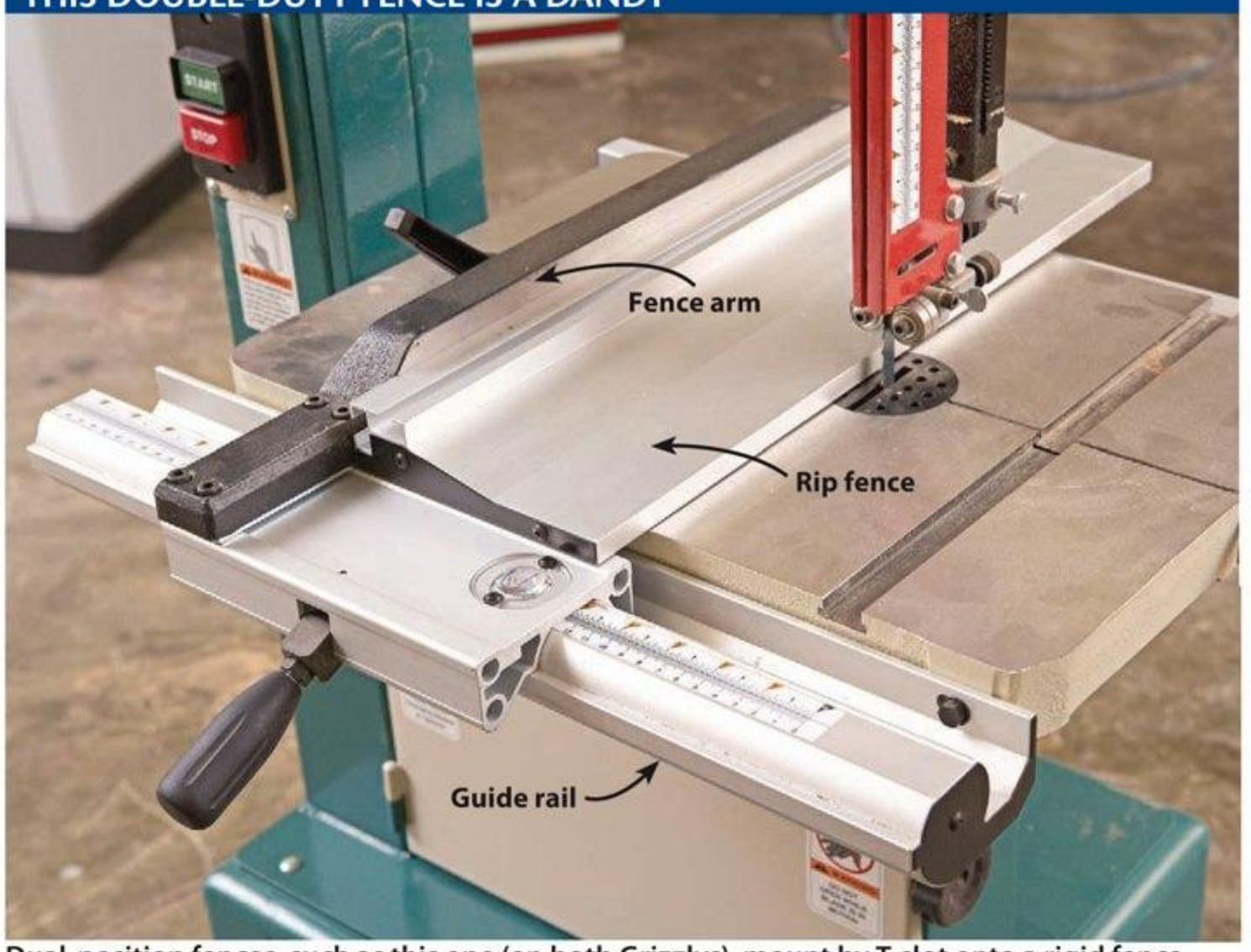
The tested saws feature three types of guides, shown *above:* steel blocks, ball bearings, and ceramic contacts. All held blades true enough in our curve-cutting and resawing tests, but we like the ceramic guides best because they completely eliminated blade twisting. (Although it wasn't a big problem, the other guides allowed slight blade twisting when we cut circles less than 1" in diameter.) The Laguna guides contact the blade at four points on each of the upper and lower guides, twice as many contact points as the other saws. The steel blocks created more friction—and potential blade-damaging heat.

Now look at these user-friendly features

■ **Comfortable table height.** Table height on five of the seven tested saws ranges from 42" to 44". Find a working height that's comfortable for you without hunching over, then look for a match. Our 6'-tall tester found himself bending down to use Laguna's 35½"-high table; he liked the Rikon 10-325's table height—just under 40"—best. If you plan to add a mobile base to your saw, remember it will add an inch or two to the table height.

■ **Accurate, adjustable rip fence.** For straight-line cutting, a rip fence proves a vital accessory, and all but the Delta and Jet include one. All the fences include adjustments to compensate for blade drift (when the blade fails to cut parallel to the fence). Four of the saws' rip fences can be used in two dimensions: upright for resawing tall stock, and low and flat, shown at *right,* for reaching underneath the blade guides on thin, narrow rips.

THIS DOUBLE-DUTY FENCE IS A DANDY



Dual-position fences, such as this one (on both Grizzlys), mount by T-slot onto a rigid fence arm that locks onto the guide rail. They give you tall and short surfaces for guiding boards.

■ **Reliable tension scale.** On these deluxe saws, we hoped for more-reliable blade-tension gauges, but found we could rely on the scales of just two saws (Grizzly G0555X and Rikon). So it's a good idea to know how to set the tension without the scale. Our tester used the flutter method, where, with the blade guides pulled back and the saw running, he loosened the blade tension until the blade fluttered side-to-side. Then he tightened it gradually until the flutter disappeared. (Watch Bob demonstrate this technique in a free video at woodmagazine.com/flutter.) All of the saws have quick-release tension levers that relieve enough tension to change blades, and then return to your previous setting without tedious cranking and checking the blade tension as you go.

■ **Effective dust collection.** Dust buildup on the rubber tires of these saws reduces blade grip, so it's important to hook up the saw to a dust collector. Each of the models in this test has a 4" port next to the lower wheel; these proved most effective on the steel-frame models. Doors on the C-frame saws did not seal as tightly, reducing dust-collection effectiveness.

A Closer Look at the Tested Saws

(Price includes riser-block kit.)

Delta 28-206, $825

800-223-7278; deltamachinery.com

+Pluses: The steel-block blade guides performed well in our curve-cutting tests, even with the riser block installed. Two speed settings provide you the option of slowing the blade speed for cutting nonferrous metal, such as brass or aluminum.

–Minuses: The 28-206 lacks the oomph of the other test saws, especially when resawing wide stock with the riser block installed. Setting the proper blade tension proved difficult because the saw's scale was so far off we could not use it. The saw vibrated more than any other we tested, its blade deflected the most (slightly more than 1/32"), and its dust collection proved inadequate. It does not come with a rip fence, and Delta does not offer one as an option. The motor eats up potential storage space in the lower cabinet.

Grizzly G0457, $895

800-523-4777; grizzly.com

+Pluses: We really like the rip fence on this saw. Although the G0457 has only 10" of resaw capacity, it was one of three models to cut with less than 1/32" of blade deflection. That's important so you don't waste wood later at the planer flattening a resawn face. And we found it easy to square the table to the back of the blade by adjusting setscrews on the trunnion bracket.

–Minuses: You can't install or remove 3/4"-wide blades without removing the table first, because the blade teeth hit the rabbeted edge of the 2"-diameter table hole. (Grizzly's Bill Crofutt said his company will investigate this and might make changes on future models.) Because the aluminum rip fence mounts onto the right side of a cast-iron arm, you can't rip stock with the fence on the right side of the blade.

(Price includes riser-block kit.)

Grizzly G0555X, $770

800-523-4777; grizzly.com

+Pluses: This saw has the same rip fence as the G0457, but it has a different table, minus the blade-changing problems. And with a 110-volt motor, it cut slightly faster than the 2-hp, 220-volt G0457. You can install a blade and rely on the tension scale to be accurate. We like its wide-rimmed task light because it mounts on the blade side of the upper cabinet, letting you better direct light onto the cutline. The price above includes an optional riser-block kit that gives you the ability to resaw 12"-wide boards. If you don't need this resaw capacity, save the $70 and assemble the saw as equipped from the factory.

–Minuses: The quick-release blade tension lever is stiffer to engage than on the other saws, although it held with no problems. Like the G0457, the rip fence will not work to the right of the blade.

Jet JWBS-14DXPRO, $1,000

800-274-6848; jettools.com

+Pluses: We could change blades quickest on this saw with its easy-to-set ball-bearing blade guides, and yellow tires on the wheels that make it easier to see the blade through the plastic window when adjusting tracking. The rack-and-pinion guide post makes it easy to adjust the top guides up and down without it crashing to the table. A second set of fence-scale markings helps you position the fence accurately for resawing with the attached pivot. If you cut brass or aluminum, you'll like the two speed settings.

–Minuses: You have to buy the $100 fence kit separately, and we'd love that 2½"-tall fence to be a few inches taller for better support during resawing. The quick-release blade-tension lever is stiffer than most

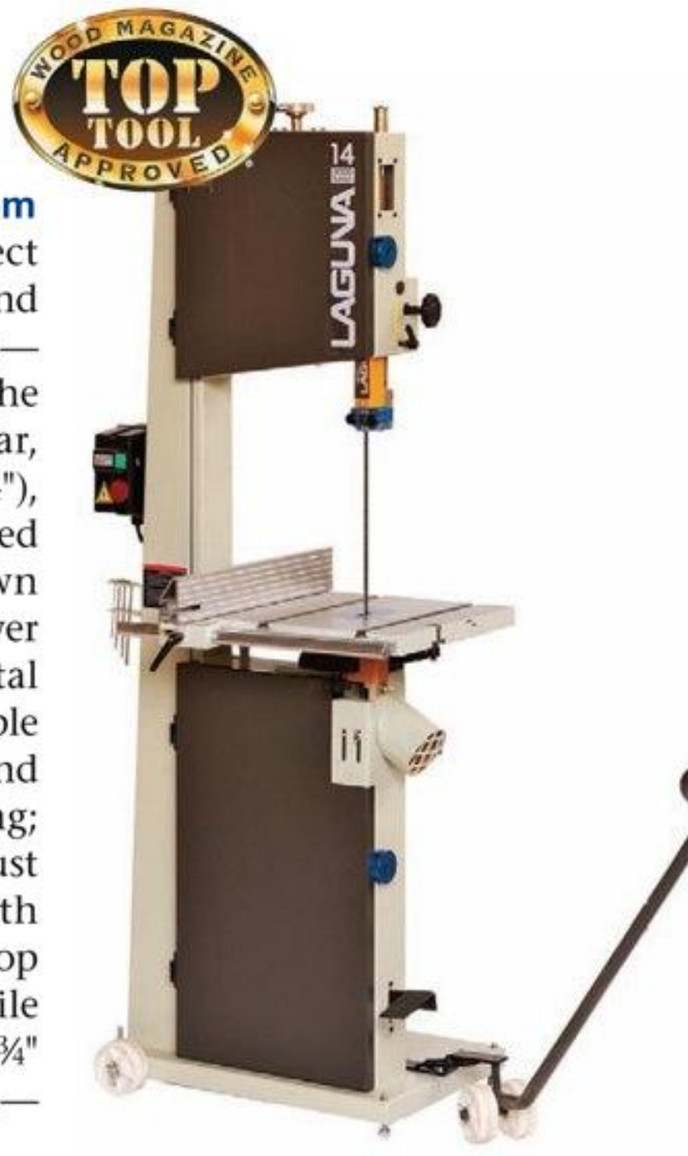
(Price includes optional rip fence and resaw pivot.)

Laguna 14SUV, $1,495

800-332-4094; lagunatools.com

+Pluses: For this price you expect a saw to deliver above and beyond competitors costing much less—and that's what you get. The 14SUV has the most power by far, the greatest resaw capacity (14"), the best blade guides, an L-shaped fence you can use in up or down positions, and a magnetic power switch that prevents accidental start-ups. It also features a table with a rack-and-pinion gear and gas strut for smooth, easy tilting; two 4" dust ports for the best dust collection; a foot brake with power disconnect to quickly stop the blade; and a built-in mobile base. Plus, it comes with a ¾" carbide-tipped resawing blade—a $160 value.

–Minuses: The table measures 35½" from the floor, about 5" too low for our 6'-tall tester. It's the noisiest of the lot—10 decibels more than the quietest. There's no lower cabinet for storage of accessories.



14" BANDSAWS $700 AND UP: WHAT TO BUY WHEN YOU DESERVE A TOP MACHINE

		PERFORMANCE RATINGS (1)														MOTOR		BLADE			TABLE			
		PRIMARY							SECONDARY															
BRAND	MODEL	POWER	CURVE-CUTTING ABILITY	BLADE-GUIDE EFFECTIVENESS	EASE OF ADJUSTING BLADE GUIDES	ABSENCE OF BLADE DEFLECTION	EASE OF CHANGING BLADES	EASE OF TENSIONING BLADE	ABSENCE OF VIBRATION	ABSENCE OF BLADE DRIFT	EASE OF TILTING TABLE	DUST-COLLECTION EFFECTIVENESS	RIP-FENCE EFFECTIVENESS	MITER-GAUGE EFFECTIVENESS	CABINET/DOORS/LATCHES QUALITY	CLARITY OF OWNER'S MANUAL	VOLTAGE (*–PREWIRED)	RATED HORSEPOWER	LENGTH, INCHES (2)	WIDTH (MIN.–MAX.), INCHES	WHEEL MATERIAL (3)	WIDTH × DEPTH, INCHES	HEIGHT FROM FLOOR, INCHES	TILT RANGE (RIGHT/LEFT), DEGREES
DELTA	28-206	C-	A	B-	A-	C+	A-	C-	C-	C	B	C	NA	NA	C	B	110*/220	1	105*	⅛–¾	A	16×16	43	45/3
GRIZZLY	G0457	B	A	B	A	A	C+	A	A	B	B	A	A	A	A	A	110/220*	2	106	⅛–¾	C	14¼×19¾	42¼	45/8
	G0555X	B	A	B	A	B	A-	A	A	B	B	B	A	A	B	A	110*/220	1½	105*	⅛–¾	C	14×20½	44	45/10
JET	JWBS-14DXPRO	B	A	B	A	B	A	B+	A	B-	B	B+	B	B	B	A	110*/220	1¼	105	⅛–¾	C	15×15	43½	45/10
LAGUNA	14SUV	A	A	A	B	A	A	A	A	A	A	A	A	NA	A	A	220	3	125	1/16–1	C	15¾×19¾	35½	45/15
POWERMATIC	PWBS-14CS	B-	A	B	A	B	A-	A	B	B-	B	B	B	B	B	A	110*/220	1½	105*	⅛–¾	C	15¼×20¾	44	45/10
RIKON	10-325	A-	A	B	B	A	A-	A	A	B+	A	A	A	NA	A	A	110*/220	1½	111	⅛–¾	C	15¾×21½	39⅝	45/5

NOTES

1. A Excellent; B Good; C Fair; NA Not Applicable
2. (*) 93½" without riser block
3. (A) Aluminum; (C) Cast iron
4. (B) Ball bearings; (C) Ceramic inserts; (S) Steel blocks
5. (*) With accessory riser block installed
6. (B) Blade; (F) Rip fence; (G) Miter gauge; (M) Mobile base; (P) Resaw pivot; (R) Riser-block kit; (T) Tools for adjustment

Powermatic PWBS-14CS, $1,000

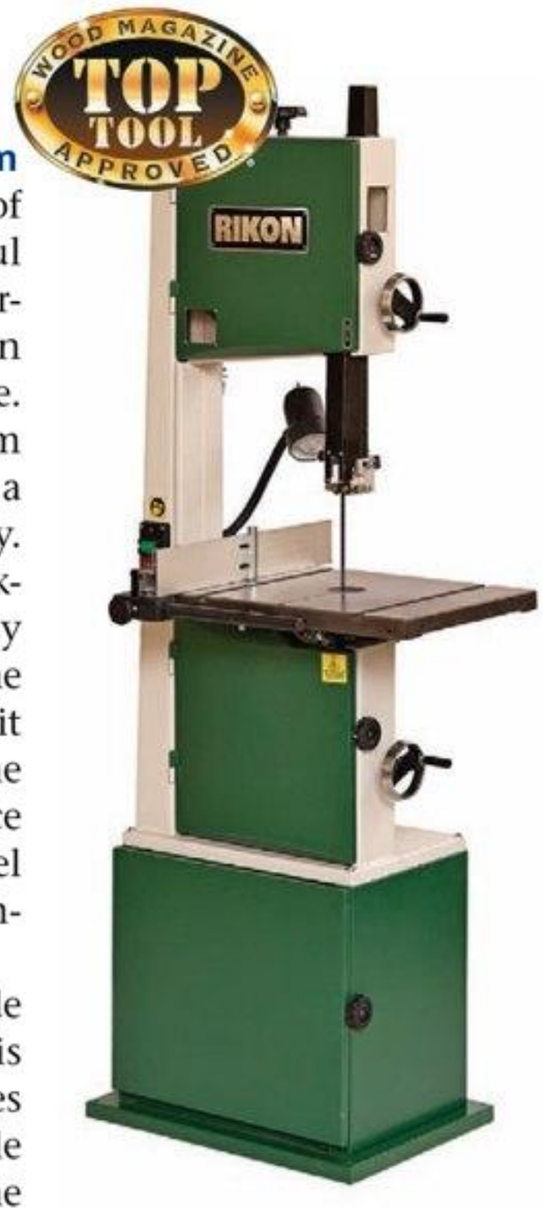
800-274-6848; powermatic.com

+Pluses: Although all the tested saws come with blade-tension quick-release handles, only this saw's orange handle could be seen from the operator position when untensioned. That helps prevent accidental start-ups with an untensioned blade. This saw comes with a 6" riser-block kit as standard equipment, as well as ⅜" and ⅝" blades. The task light mounts and works like that on the Grizzly G0555X. It's nice to have cabinet-mounted hooks for storing the rip fence and miter gauge.

–Minuses: Despite a 1½-hp rated motor, this saw bogged down frequently in our resaw testing, necessitating a slower feed rate. The ¼" plastic tubing intended to blow dust off the cutline does little good. And the motor sits inside the lower cabinet, negating potential storage space.

Rikon 10-325, $900

877-884-5167; rikontools.com



+Pluses: The 10-325 has 13" of resaw capacity and a powerful 110-volt motor. The near-absence of blade deflection makes it a great resaw machine. We like its L-shaped aluminum rip fence that locks solidly on a steel rod, yet slides off quickly. And there's more to like: a rack-and-pinion gear makes for easy table tilting; setscrews on the table trunnion bracket help it easily square the table to the blade; yellow tires enhance blade visibility; and two wheel speeds ease the cutting of non-ferrous metals.

–Minuses: You'd expect blade changes to be easiest on this saw because the blade slides forward through the table rather than to the side. But the guide bearings move as you tighten their setscrews, making it more difficult to set up accurately, resulting in the test-longest setup times.

	BLADE-GUIDE STYLE (4)	RESAW (5)	CUT CAPACITIES, INCHES: THROAT (BLADE TO COLUMN)	OVERALL DIMENSIONS (W×D×H), INCHES	TASK LIGHT? (YES, NO)	ACCESSORIES (6): STANDARD	ACCESSORIES (6): OPTIONAL	NOISE LEVEL, NO-LOAD, DECIBELS	WEIGHT, POUNDS	POWER-CORD LENGTH	WARRANTY, YEARS	COUNTRY OF ASSEMBLY (7)	SELLING PRICE (8)
	S	12*	13⅝	27×23×74	N	B	M,R	67	201	6'8"	5	C	$825*
	B	10	13½	30×30×73	N	B, F, G	M	63	251	8'	1	T	$895
	B	12*	13½	17×16×74	Y	B, F, G	M,R	65	236	5'9"	1	T	$770*
	B	12	13½	17×24×77	N	B, G, T	F,M,P	63	247	5'10"	5	T	$1,000#
	C	14	13½	30×26×70	N	B, F, M, T		73	420	6'2"	1	C	$1,495
	B	12*	13½	34×20×74	Y	B, F, G, P, R, T	M	65	250	5'10"	5	T	$1,000*
	B	13	13⅝	30×24×76	Y	B, F, P, T		64	251	6'7"	5	C	$900

7. (C) China
   (T) Taiwan

8. Prices current at time of article production and do not include shipping, where applicable.
   (*) Includes riser-block kit.
   (#) Includes rip-fence kit.

Commit your tool $$ to these resaw kings

Not surprisingly, the $1,495 Laguna 14SUV proved itself superior in this seven-saw field, earning it our Top Tool award for 220-volt models. Try as we might, we could not bog down this 3-hp workhorse, even when resawing 14"-wide oak and ash.

If your shop's not wired for 220 volts, or if you can't afford the Laguna's price tag, go for the Rikon 10-325 for $900. It's our Top Tool among 110-volt saws.

If both of these fall out of your price range, then look to the Top Value Grizzly G0555X. Add the optional riser block and you'll have a saw worthy of any shop for less than $800.

Produced by **Bob Hunter** with **Bob Saunders**
Illustration by **Tim Cahill**

MORE RESOURCES

- Watch a free video for an alternative technique on setting blade tension at woodmagazine.com/bladetension.
- Find helpful tips and techniques as well as reviews of other bandsaws at woodmagazine.com/bandsaw.

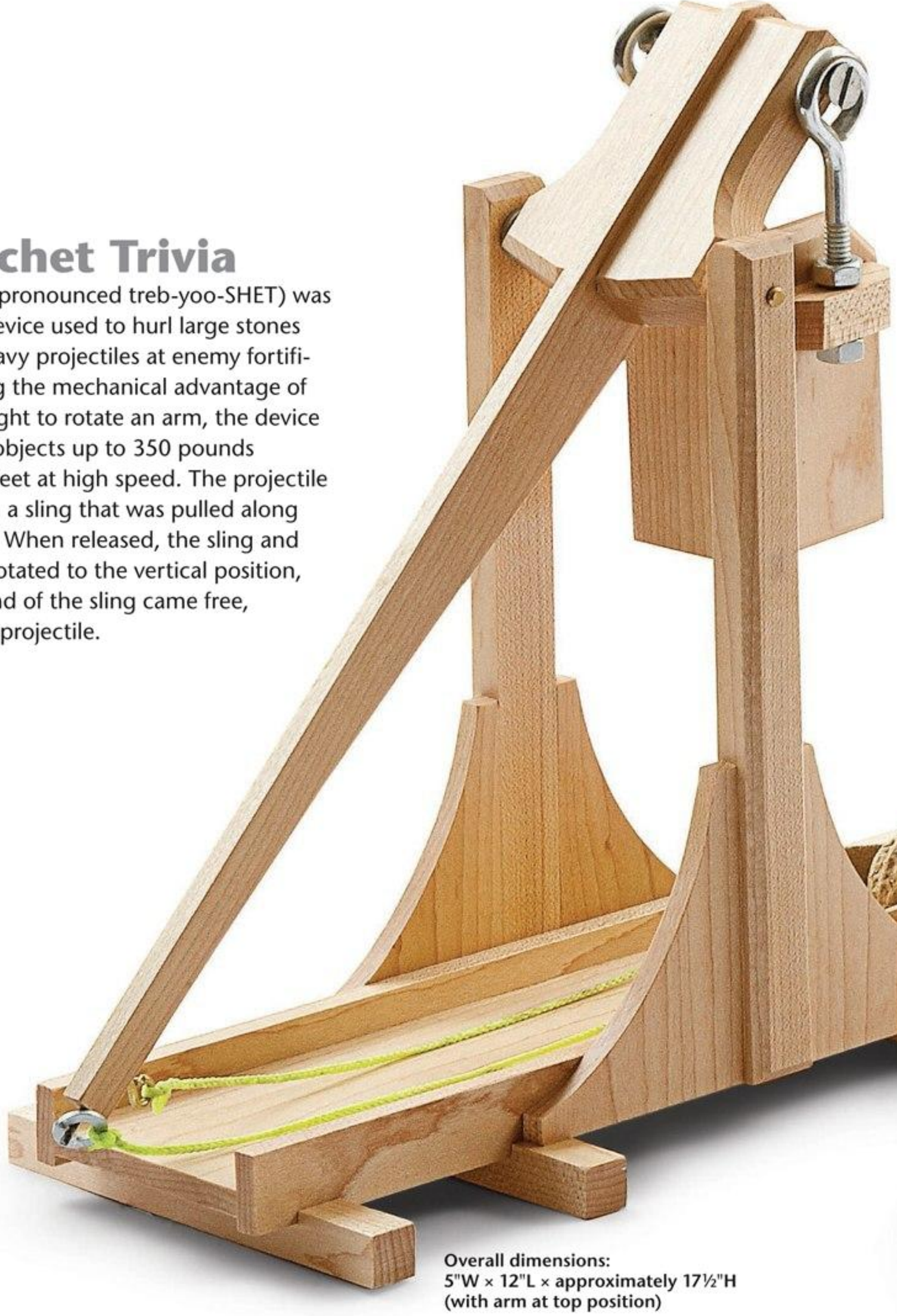
"Loads" of fun

Trebuchet

Catapult fun into high gear with this easy-to-build, thing-slingin' toy.

Trebuchet Trivia

A trebuchet (pronounced treb-yoo-SHET) was a medieval device used to hurl large stones and other heavy projectiles at enemy fortifications. Using the mechanical advantage of a counterweight to rotate an arm, the device could heave objects up to 350 pounds hundreds of feet at high speed. The projectile was placed in a sling that was pulled along the platform. When released, the sling and arm rapidly rotated to the vertical position, where one end of the sling came free, releasing the projectile.



Overall dimensions:
5"W × 12"L × approximately 17½"H
(with arm at top position)

Launch into the platform

1 From ¼" maple (or ¾" stock resawn or planed to ¼"), cut the platform sides (A) and platform (B) to the sizes listed [**Materials List**, *page 74*]. Place a couple of ⅛" spacers under the platform. Glue and clamp the sides to the edges of the platform, flush with the ends [**Drawings 1 and 1a**], checking the sides and platform for square.

2 From ½" stock, cut the feet (C) to size. Fit your tablesaw with a ¼" dado blade. Then, using a miter gauge with an extension, and your rip fence as a stop, cut a ⅛"-deep dado 1" from each end of the feet and spaced 2½" apart, where dimensioned [**Drawing 1**], flipping the feet end for end between cuts.

Quick Tip! Cut dadoes in a test piece first for an exact setup. When using a cut-flip-cut method to form dadoes in parts, such as the feet, any offset doubles the spacing error between the dadoes. Make test cuts in scrap the same size as the part to verify correct spacing of the dadoes before you cut the parts. Apply glue in the dadoes. Now mount the feet to the platform sides (A) where dimensioned and as shown [**Photo A**].

Raise your arm supports

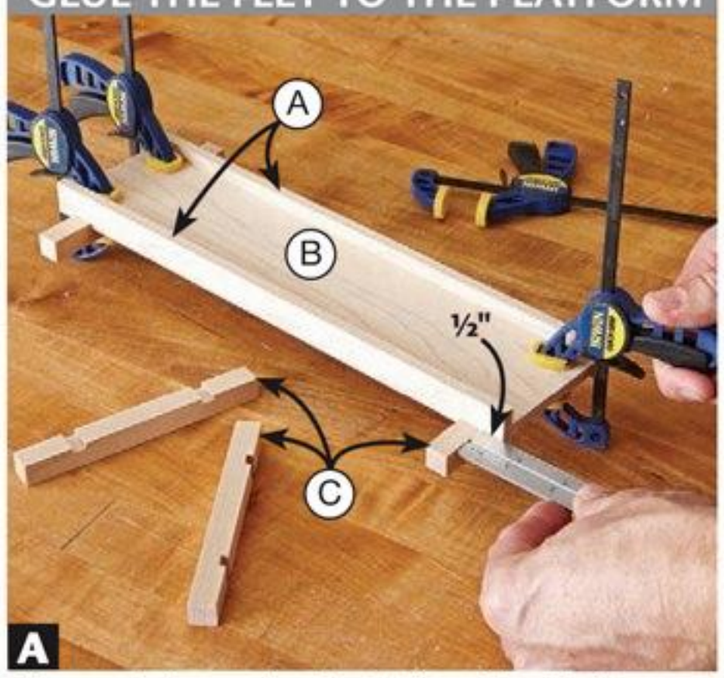
1 From ½" stock, cut the arm supports (D) to size. Using your table-mounted router and a 45° chamfer bit, rout ⅛" chamfers along the *outside* edges and on the top and bottom of each support, where shown [**Drawing 1**]. Then drill a centered 3/16" hole through each support where dimensioned to receive a 3/16"-diameter brass rod.

2 Make four photocopies of the full-size **Brace Pattern** found in the *WOOD Patterns*® insert. From ¼" stock, cut the braces (E) to the size listed and spray-adhere a pattern to each brace. Then bandsaw (or scrollsaw) the parts and sand to the pattern line. Remove the patterns, rubbing them with a cloth moistened with lacquer thinner to loosen the adhesive.

3 Apply glue along the *long* edge of two braces (E). Clamp the braces to an arm support (D), flush with the support's *bottom* and *inside* (nonchamfered) face. Repeat for the remaining braces and support.

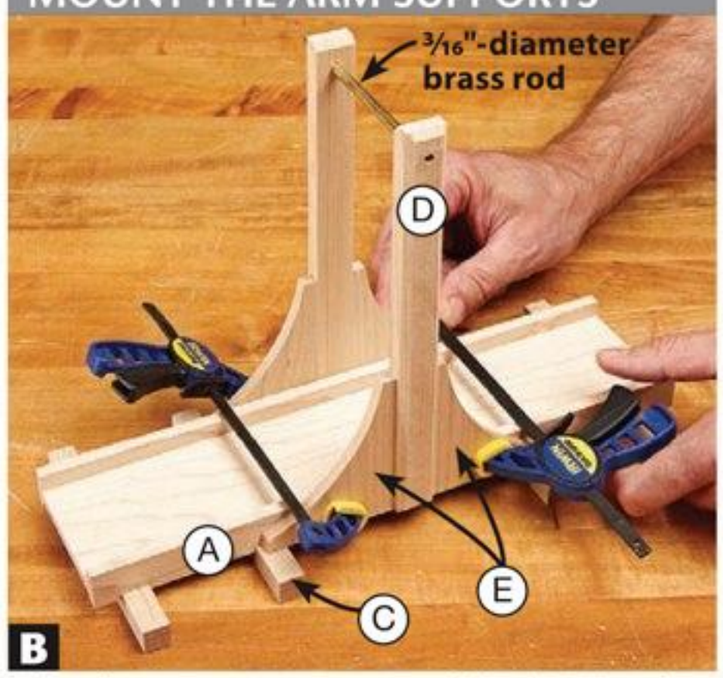
4 To mount the arm-support assemblies (D/E) to the platform assembly (A/B/C), hacksaw a 4¼"-long piece of 3/16"-diameter brass rod for aligning the supports. Apply glue to the bottom ⅜" along the *inside* face of each arm-support assembly, and insert the brass rod through the 3/16" holes in the supports, as shown [**Photo B**]. Now mount the assemblies, centered on the platform assembly inner feet (C). After the glue dries, remove the brass rod.

GLUE THE FEET TO THE PLATFORM

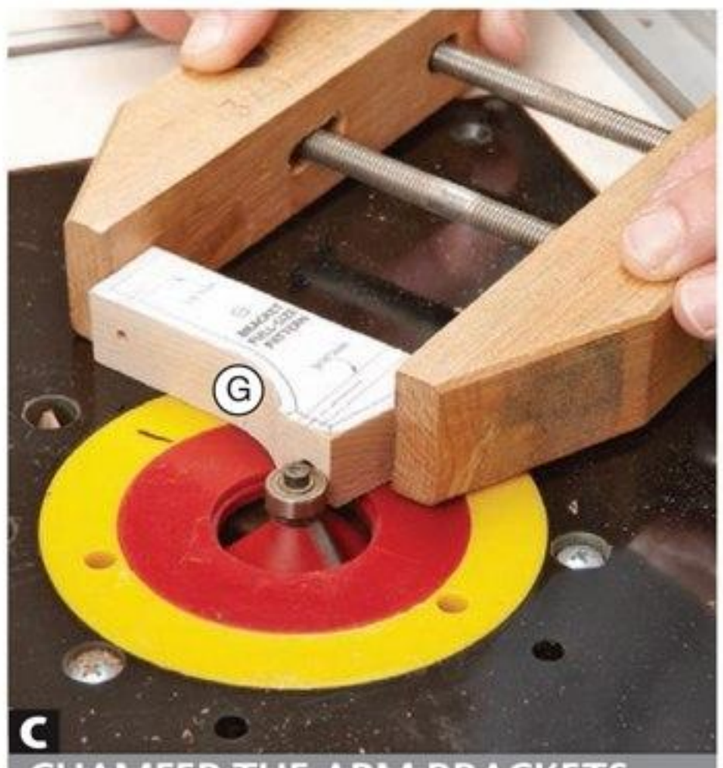


Glue and clamp the feet (C) to the platform sides (A), positioning the outer feet as shown and the inner feet 2" from the outer feet.

MOUNT THE ARM SUPPORTS



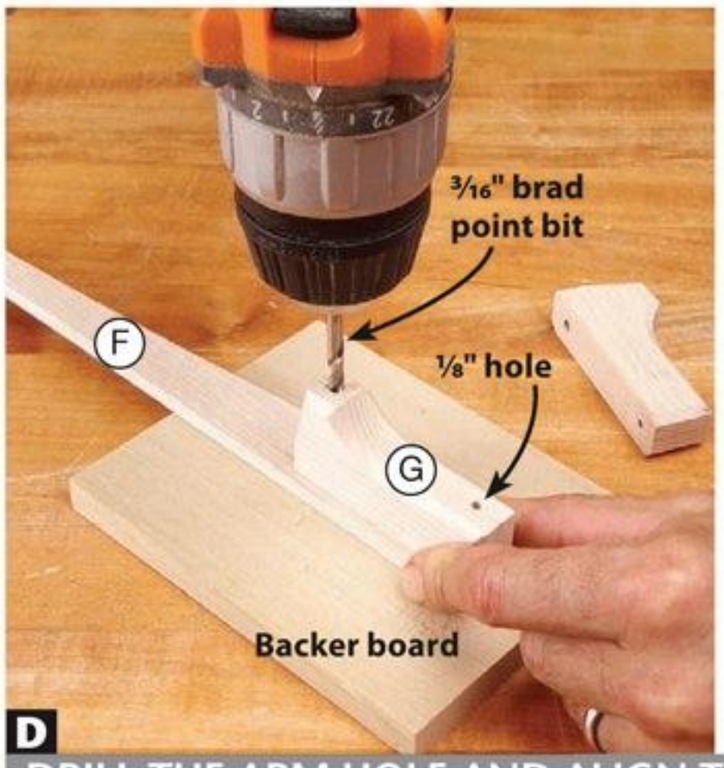
Glue the arm-support assemblies (D/E) to the platform sides (A). Center them on the inside feet (C) and align them with the brass rod.



C

CHAMFER THE ARM BRACKETS

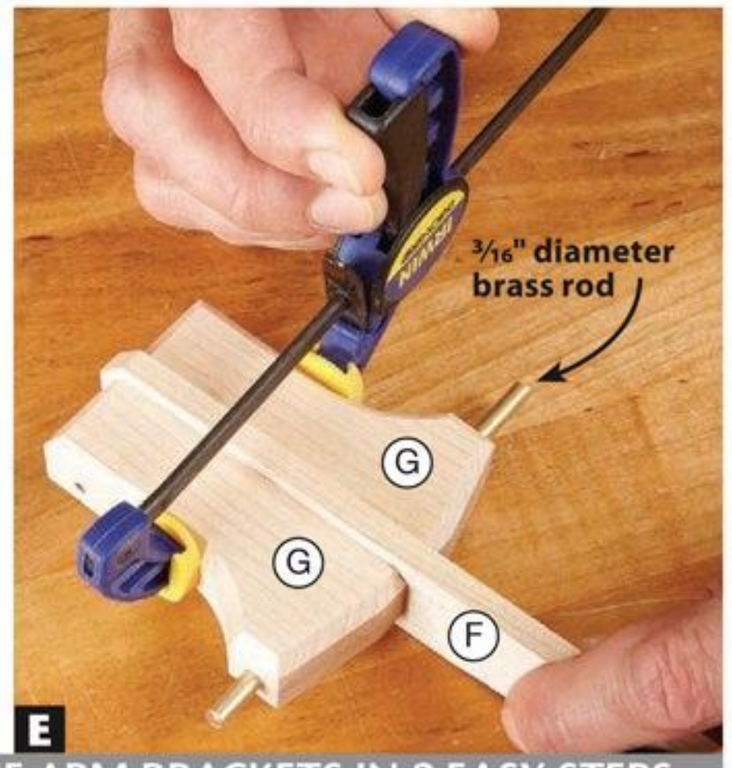
Clamp the brackets in a handscrew and rout ⅛" chamfers on the arm brackets (G) where shown on the pattern.



D

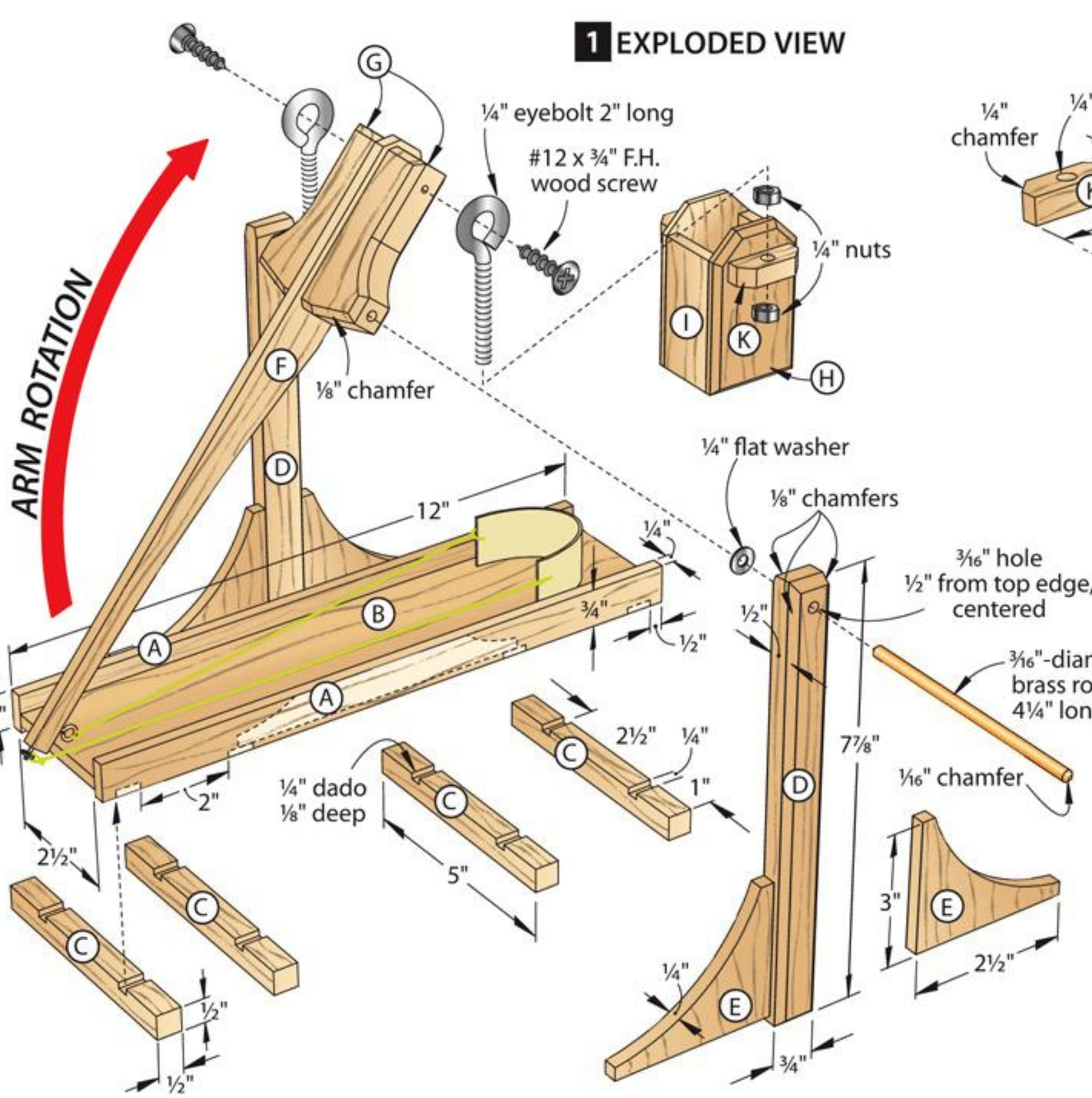
DRILL THE ARM HOLE AND ALIGN THE ARM BRACKETS IN 2 EASY STEPS

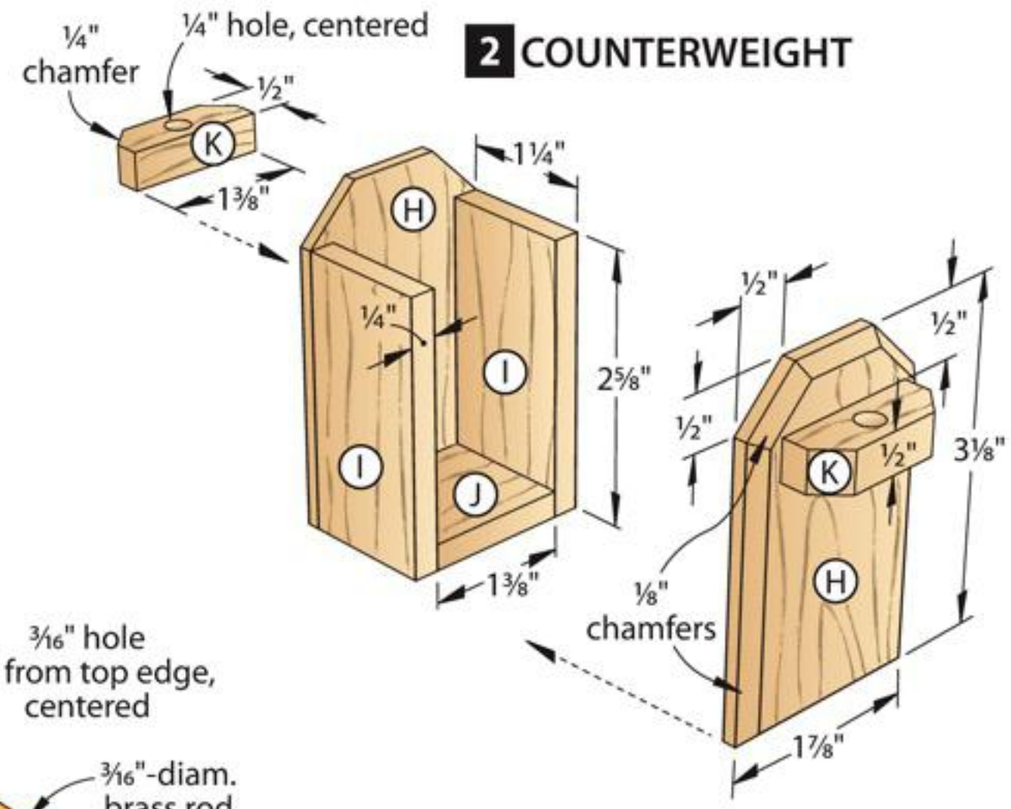
With an arm bracket (G) glued to the arm (F), drill a 3⁄16" hole through the arm, using the hole in the bracket as a guide.

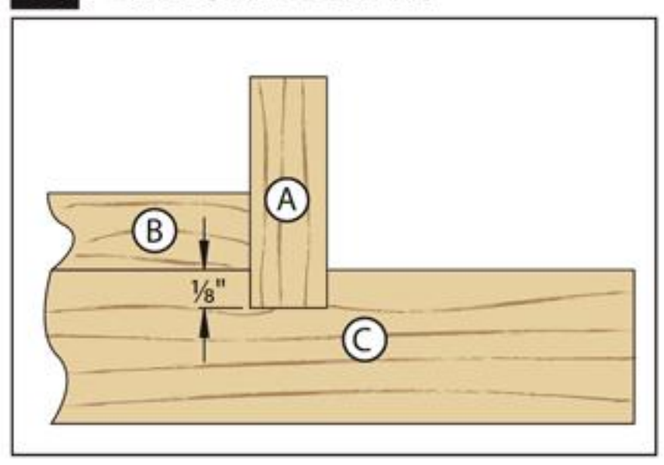


E

Glue and clamp the opposing arm bracket (G) in position, inserting the 3⁄16"-diameter brass rod through the assembly to align the parts.







Next up: The arm and brackets

1 From ¼" stock, cut the arm (F) blank to size. Photocopy the **Arm Pattern**; then spray-adhere it to the arm blank. Bandsaw and sand the arm to the pattern lines. Remove the pattern.

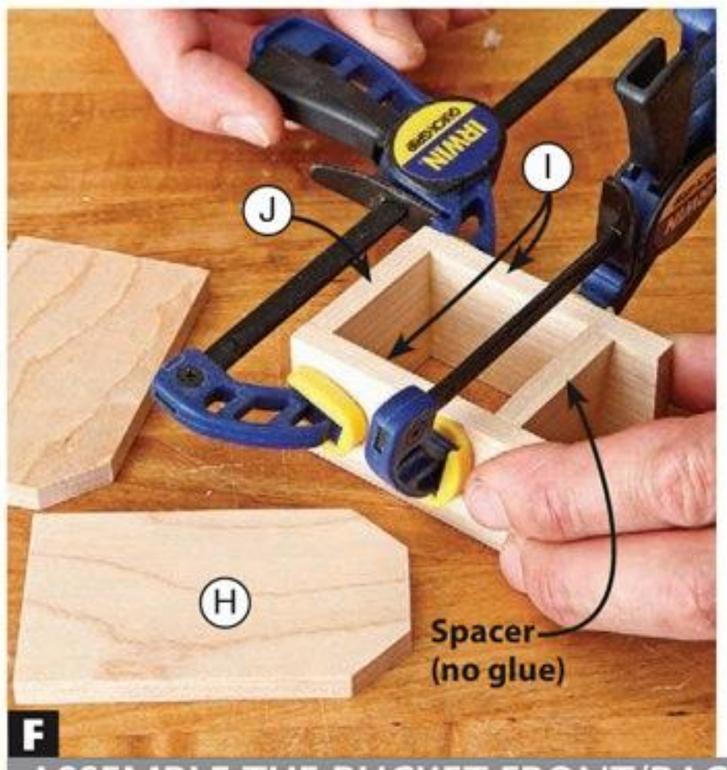
***Note**: You'll drill the 3⁄16" hole, shown on the pattern, through the arm after gluing an arm bracket (G) in place.*

2 To form the arm brackets (G), cut a 1⅜ × 12" blank from ¾" stock. Make two copies of the full-size **Arm Bracket Pattern**. Spray-adhere the patterns to the blank. Then bandsaw and sand the brackets to shape.

3 Using your drill press, drill the ⅛" and 3⁄16" holes through the edges of the arm brackets (G) where shown on the patterns.

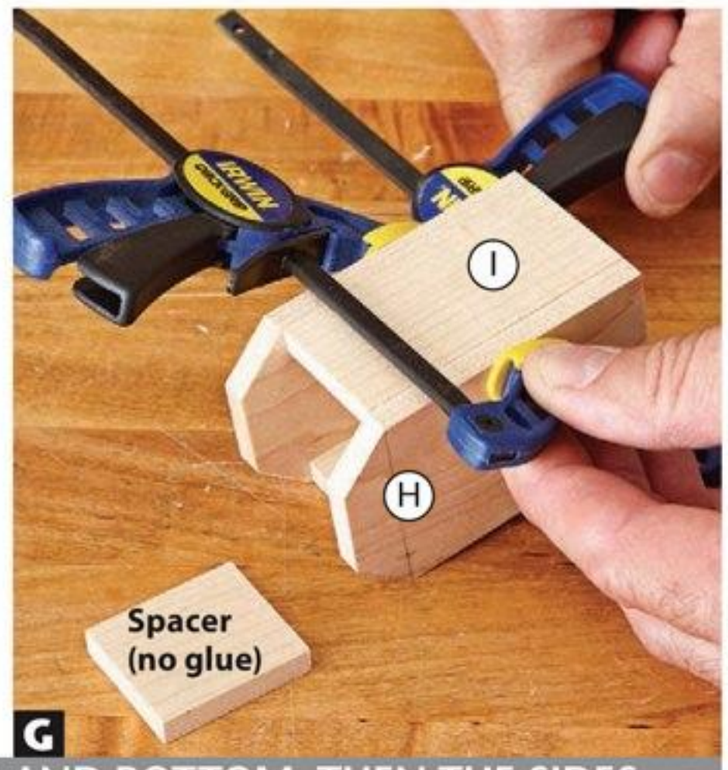
Quick Tip! Drilling pointers. Drill the 3⁄16" holes accurately to ensure proper parts alignment later with the brass rod. To prevent bit wandering on the hard maple, use brad-point bits instead of twist bits. Also, for perfectly aligned holes, verify that your drill-press table is exactly 90° to the drill bit.

Now rout ⅛" chamfers along the indicated edges and ends on both faces of



F

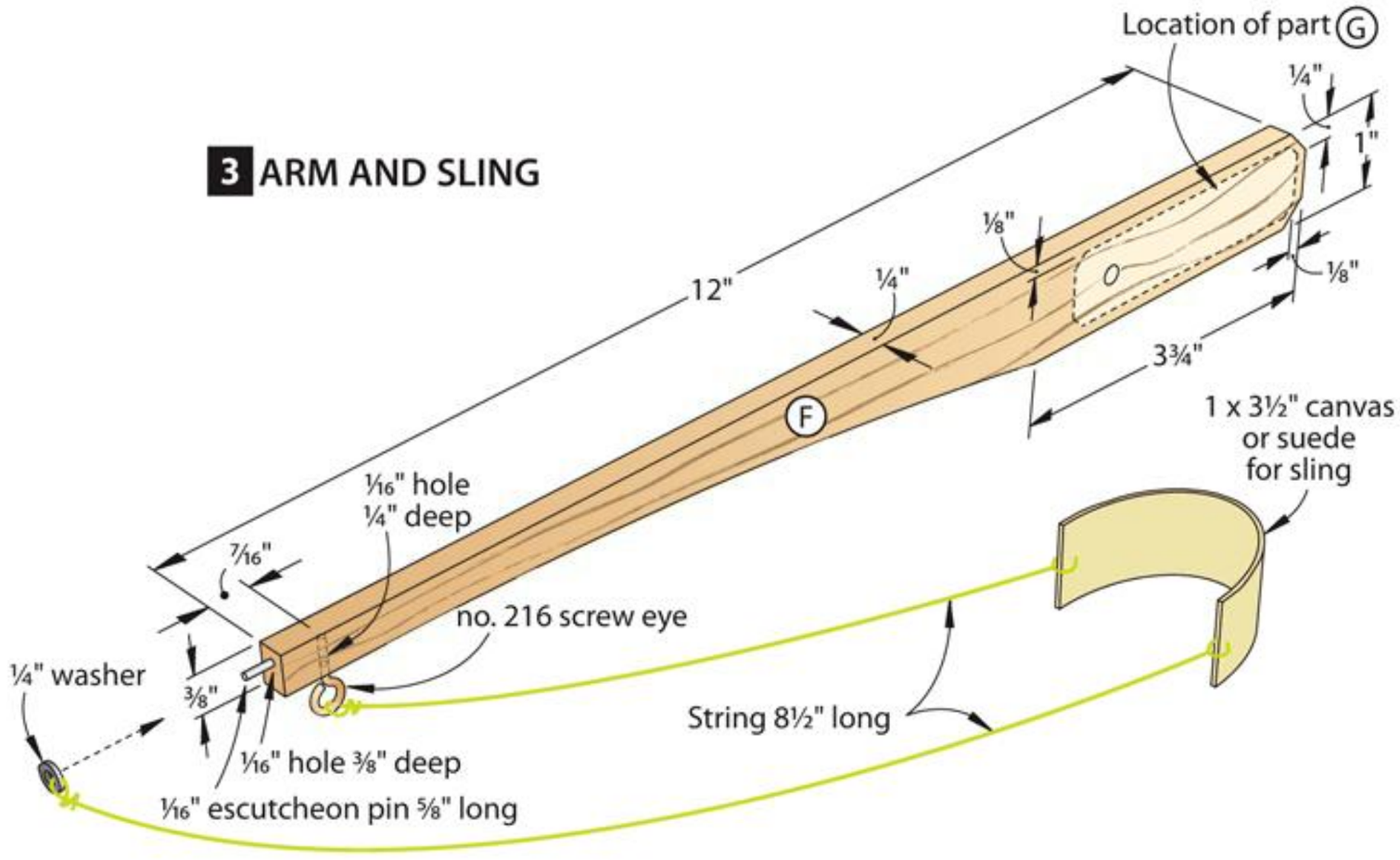
Apply glue to the ends of the bottom (J). Clamp the front and back (I) to the bottom using a spacer to keep the assembly square.



G

Now apply glue to the edges of the front/back and bottom assembly (I/J). Clamp the sides (H) to the assembly.

ASSEMBLE THE BUCKET FRONT/BACK AND BOTTOM, THEN THE SIDES



SHOP TIP

Don't have a router plate with inserts? Make an "onsert"!

Here's a simple and super-fast way to make an overlay for your router-table top. It covers the throat opening to provide a zero-clearance fit with the bit, and ensures sufficient support and safety when routing small parts. And you'll find the price easy to swallow—only scrap hardboard required.

- Cut a piece of ¼" hardboard of sufficient size to provide continuous support of the part while moving it about on your router table.
- Drill a centered hole through the hardboard just large enough for the bit bearing to pass through.
- Clamp or double-faced-tape the hardboard to the router-table top with the hole centered over the lowered bit.
- Turn on the router and raise the bit until it's just a hair higher than needed to cut the chamfer.
- Lower the bit to the required cutting height, and rout the part.

the brackets [**Photo C**]. Remove the patterns. For safety when routing these small parts, hold them with a handscrew and reduce the opening around the bit to a minimum. You can close up the opening using snap-in inserts, as shown, if you have this type of router plate. If not, refer to the **Shop Tip**, *top right*, for an easy-to-make alternative.

4 Refer to the **Arm Pattern** for the location of the arm brackets (G). Glue and clamp a bracket to the arm (F). After the glue dries, drill the 3/16" hole through the arm to receive the brass rod later as shown [**Photo D**]. Then glue the remaining bracket to the arm with the 3/16" holes aligned [**Photo E**].

Now build the counterweight bucket

1 From ¼" stock, cut the counterweight bucket sides (H), front and back (I), and bottom (J) to the sizes listed. Make an extra bottom for use as a spacer. Lay out, bandsaw, and sand ½×½" angled corners on the top of each side (H) [**Drawing 2**]. Now assemble the bucket as shown [**Photos F and G**].

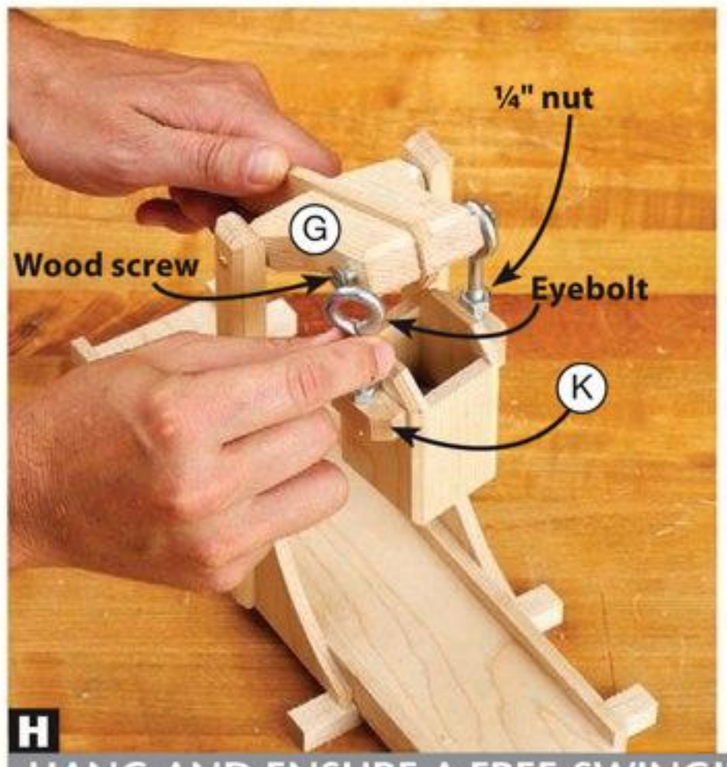
2 Rout ⅛" chamfers on the outside face of the bucket sides (H) where shown [**Drawing 2**].

3 From ½" stock, cut the bucket brackets (K) to size. Using a brad-point bit, drill a centered ¼" hole through the brackets where shown. Then form ¼" chamfers at the ends. Because of the small size of these parts, safely hand-sand the chamfers using a sanding block with 100-grit sandpaper.

4 Glue and clamp the brackets (K) to the sides (H), ½" from the top ends and centered side-to-side.

Finish up

1 Drill a 1/16" hole ¼" deep for a no. 216 screw eye into the arm (F) where dimensioned [**Drawing 3**]. Then drill a 1/16" hole ⅜" deep into the narrow end of the arm for a 1/16" escutcheon pin ⅝" long where dimensioned. Thread in the screw eye, and drive the pin, leaving a projection of ¼".



Rotate each eyebolt to fit it over the wood screw in each arm bracket (G). Tighten the nuts to secure the eyebolts.

Tighten the wood screws in the arm brackets (G) enough to secure the bucket assembly while ensuring that it pivots freely.

HANG AND ENSURE A FREE-SWINGING COUNTERWEIGHT BUCKET

2 To make the arm-pull sling, cut two pieces of string 8½" long and a 1×3½" piece of canvas or suede. Using an awl, punch a centered hole through the material near each end where shown. Tie one piece of string to a hole in the sling and the other end to the screw eye. Tie the other string to a ¼" flat washer and the remaining hole in the sling.

3 Before mounting the arm/arm-bracket assembly (F/G) between the arm supports (D), drive a #12×¾" flat-head wood screw approximately ½" into the ⅛" hole in each arm bracket (G) [**Drawing 1**]. Then pivot-mount assembly F/G between the arm supports, using the 3⁄16"-diameter brass rod and ¼" flat washers inserted between the assembly and supports where shown. Center the rod end to end.

4 To suspend the counterweight bucket (H/I/J/K) from the arm assembly, attach a ¼" eyebolt 2" long to each bucket bracket (K) with two ¼" nuts where shown [**Drawing 1**], leaving the nuts loose. Then hang the bucket and tighten the hardware as shown [**Photos H and I**].

5 Finally, sand the trebuchet to 220 grit, remove the dust, and apply a finish, if you wish. We sprayed ours with three coats of satin aerosol lacquer. Ready for some treat-tossin' fun? Refer to the sidebar "**How to use the launcher**," *right*, for safety and operating tips. Now start hurling!

Produced by **Owen Duvall** with **Kevin Boyle**
Project design: **Jeff Mertz**
Illustrations: **Roxanne LeMoine; Lorna Johnson**

MORE RESOURCES

FREE ARTICLES

- Saw Small Pieces Safely
woodmagazine.com/sawsmall
- Jig to Rout Small Pieces Safely
woodmagazine.com/routsmall
- Small-parts Downdraft Table
woodmagazine.com/tinydowndraft

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Launcher						
A	platform sides	¼"	¾"	12"	M	2
B	platform	¼"	2½"	12"	M	1
C	feet	½"	½"	5"	M	4
D	arm supports	½"	¾"	7⅞"	M	2
E	braces	¼"	2½"	3"	M	4
F	arm	¼"	1"	12"	M	1
G*	arm brackets	¾"	1⅜"	3⅛"	M	2
Counterweight Bucket						
H	sides	¼"	1⅞"	3⅛"	M	2
I	front/back	¼"	1¼"	2⅝"	M	2
J	bottom	¼"	1¼"	1⅜"	M	1
K	brackets	½"	½"	1⅜"	M	2

*Parts initially cut oversize. See the instructions.

Materials key: M–maple.
Supplies: 3⁄16"-diameter brass rod 4¼" long; no. 216 screw eye; 1⁄16" escutcheon pin ⅝" long; 8½"-long string (2); 1×3½" piece of canvas or suede; ¼" flat washers (3); #12×¾" flathead wood screws (2); ¼" eyebolt 2" long (2); ¼" nuts (4).
Blade and bits: Dado blade set; 45° chamfer router bit; ⅛", 3⁄16", and ¼" brad-point bits.

How to use the launcher

Though similar in concept to the giant war machines of old, this project is designed and scaled to sling small, lightweight snack items, such as peanuts (in the shell) and candy, toward a bucket or target for entertainment purposes only. To safely operate the trebuchet and ensure it's the "lift" of the party, follow these tips.

For safety's sake:

- Wear eye protection.
- Never aim the trebuchet at a person or animal.
- Do not launch metallic or sharp objects.

To operate the launcher:

- Place small weights, such as ¼×1" fender washers or coins, in the counterweight bucket. The number of weights needed depends on the object type and the desired launch trajectory and distance to the target. You'll find the optimum weight by experimentation. We found that 14 fender washers were ideal to sail a peanut about 15 feet.
- Place your "ammo" in the sling, and slip the ¼" flat washer attached to the end of the sling's free string over the escutcheon pin at the end of the arm (F). NOTE: Bending the escutcheon pin slightly up or down also alters the release timing and projectile path.
- Pull the sling along the platform (B), raising the counterweight bucket, until the tip of the arm contacts the platform. Align the arm with your target, and let go of the sling to ***fire away!***

Watch a FREE video of the trebuchet in action at:
woodmagazine.com/trebuchet

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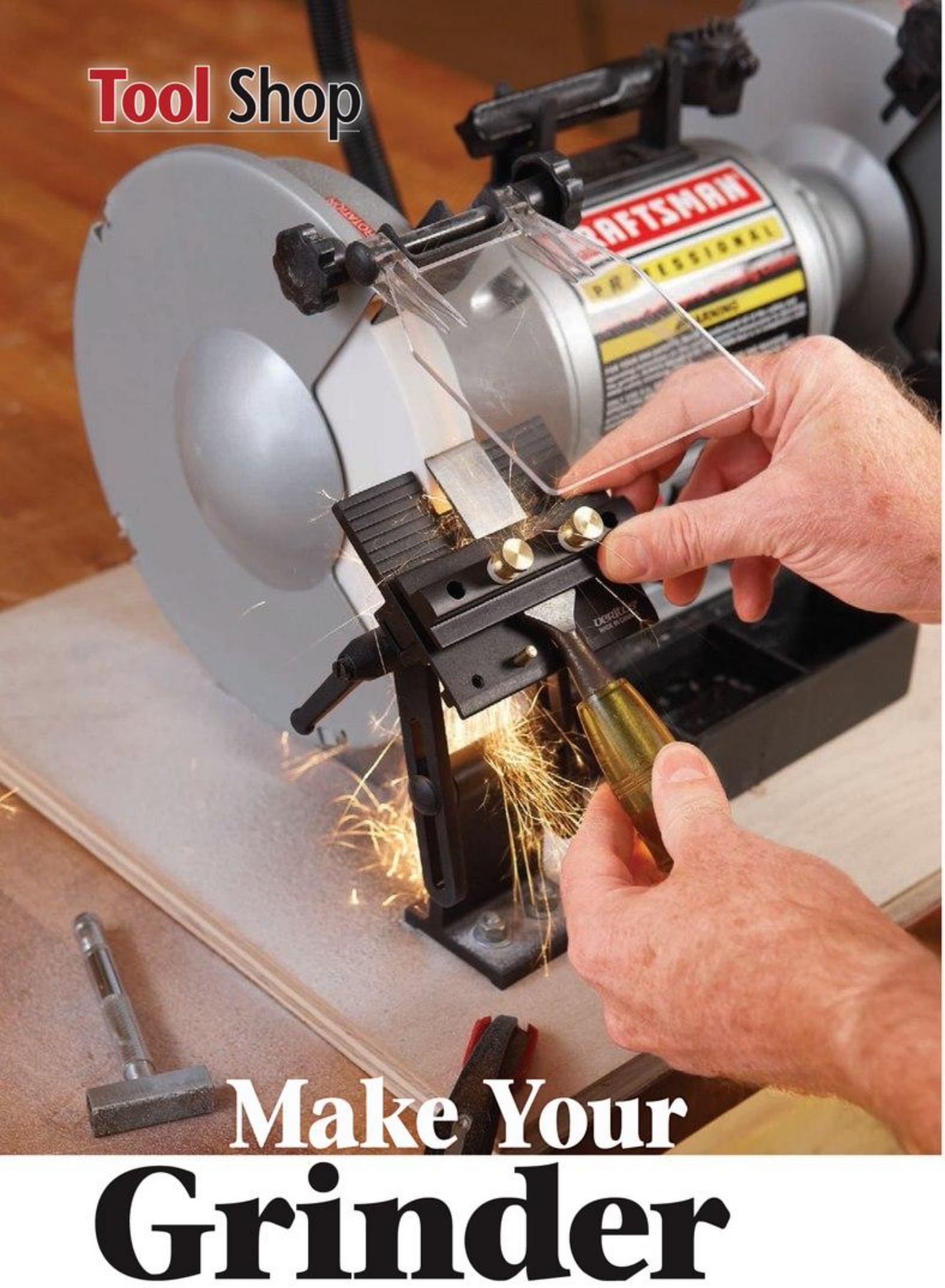


Make Your Grinder Greater

Improve the performance of your bench grinder with these simple tips and accessories.

Most bench grinders, whether outfitted with 6" or 8" wheels, come ill-equipped from the factory for use in a woodworking shop, thanks to stone wheels that prove too coarse for sharpening fine-cutting tools, clumsy tool rests, and accessories that are inadequate or just not helpful. Follow these simple steps to turn a ho-hum grinder into a smooth operator in no time.

Top performance always comes down to the wheels

Most grinders come with 36- and 60-grit silicon carbide wheels, identifiable by the gray, coarse texture. Those work great for lawn mower blades, but not for woodworking tools. So replace the 36-grit wheel with a 100- or 120-grit aluminum oxide wheel (usually sold in white or blue colors). Although the softer aluminum oxide wears more quickly than the silicon carbide, it also grinds cooler, saving the temper of your tools' steel. (See **Sources** on *page 78* to buy these wheels.) Keep the aggressive 60-grit wheel for quickly reshaping chipped or damaged tool edges. Then go to the finer wheel for final sharpening.

Most grinders come with ¾"-wide wheels, but 1"- or 1¼"-wide wheels sharpen wider tools without sliding the tool side-to-side. To install wide wheels on many grinders you'll have to replace the bell-shaped flanges—which eat up ½" or more of the arbor shaft on each side of the wheel—with thinner supports. We recommend tablesaw blade stiffeners [**Sources**], typically about ¼" thick, that measure at least 3" in diameter. [**Photo A**.]

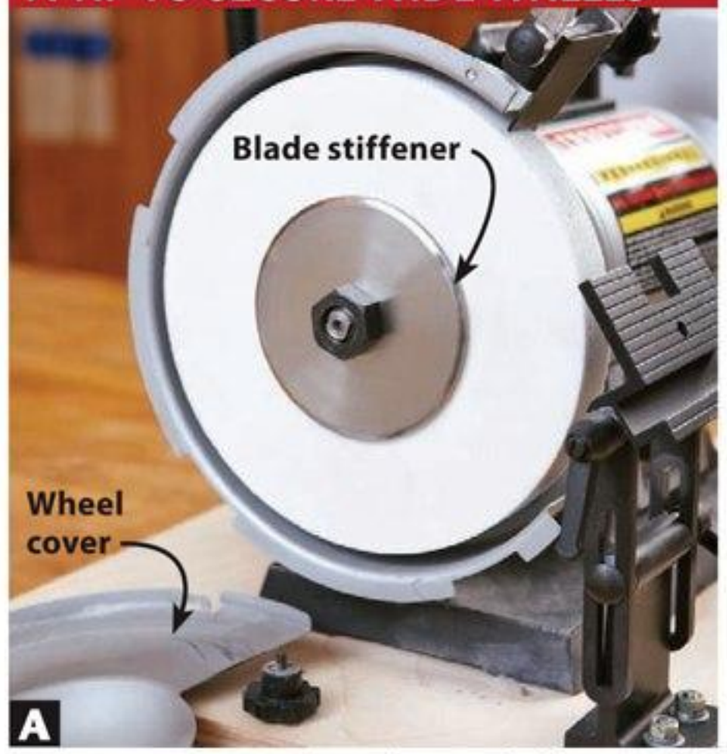
If you notice vibration, install balancers [**Sources**] on your grinder wheels, as shown in **Photo B** on *page 78*. Start by mounting your wheel on the balancing flange—which requires a 1" arbor bore in the wheel—and securing

continued on page 78

Start with these tips for better sharpening

- Plug the grinder directly into an outlet. Many grinders require high amperage at start-up and typically run hot anyway, and an extension cord could magnify this problem.
- If your grinder has a variable-speed motor, run it at the slowest speed when shaping or sharpening a tool to reduce heat buildup. Save the high speeds for cleaning rust and gunk from tools with a wire wheel or polishing or stropping with a buffing wheel.
- Keep a "quench cup" nearby filled with fresh water to cool tools as they heat up.

A TIP TO SECURE WIDE WHEELS



Be sure you can tighten the nut fully onto the arbor shaft. For wide wheels, you might need to replace the flange with a blade stiffener.

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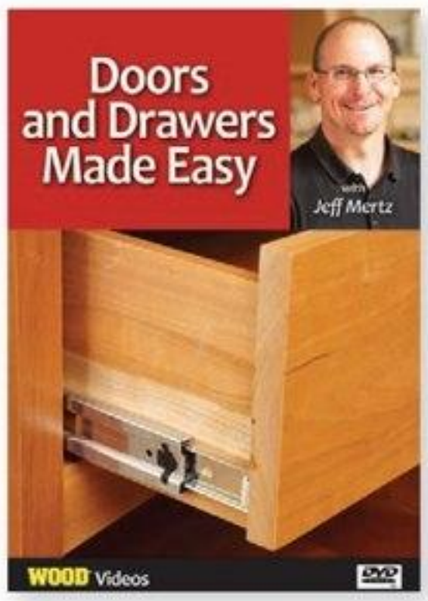

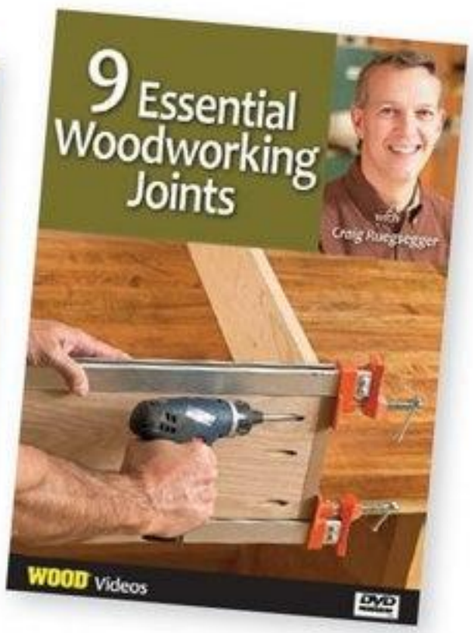

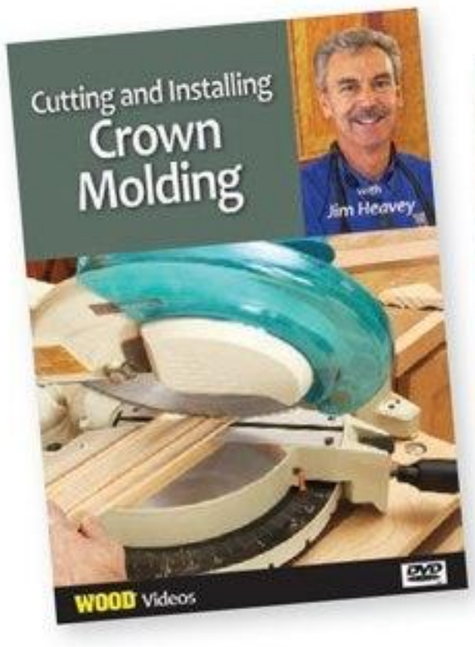

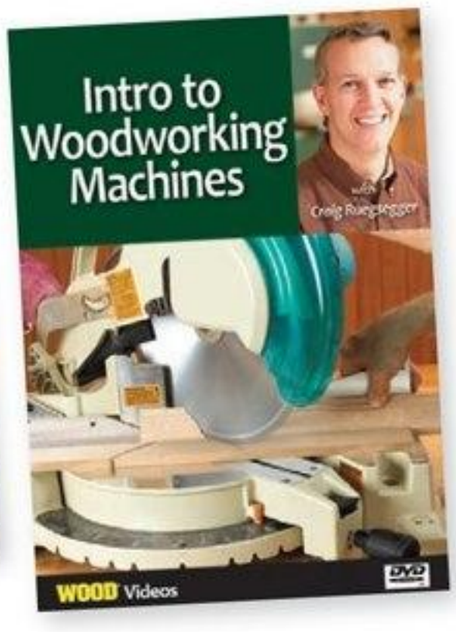

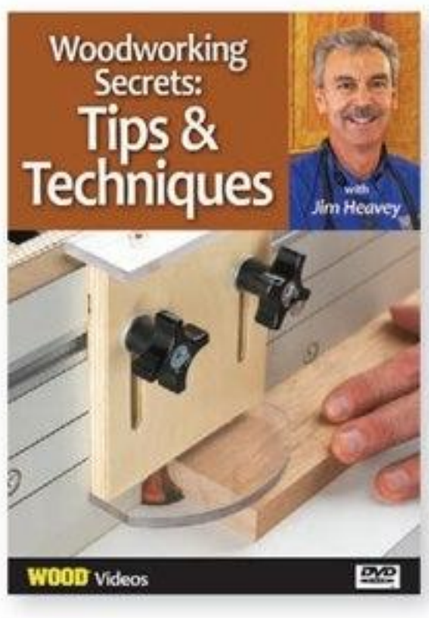

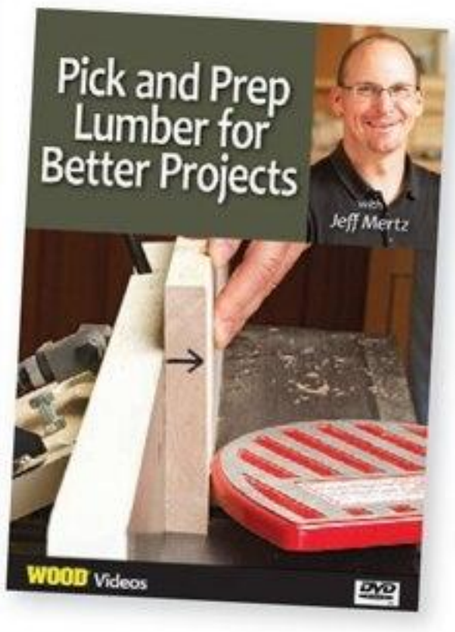

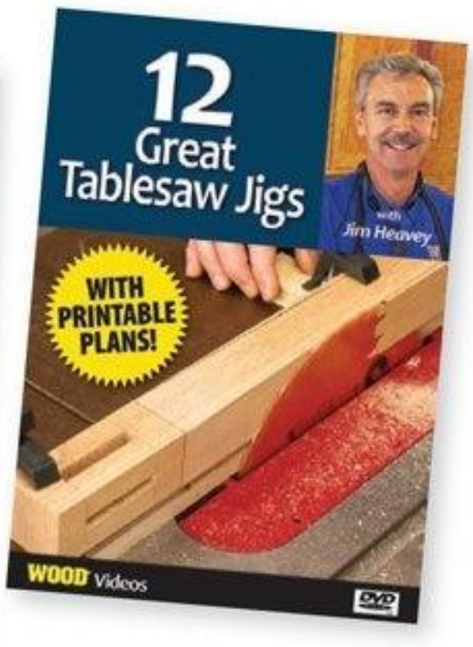

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the three balance bolts in the "4-8-12" clock positions. Next, mount the flange and wheel on the included stand. Starting with the same bolt at the top each time, rotate the wheel gently and let it coast to a stop. If the top bolt consistently returns to the 12 position, adjust the other two bolts toward it slightly to compensate for the out-of-balance weight. Repeat until the wheel stops in random positions.

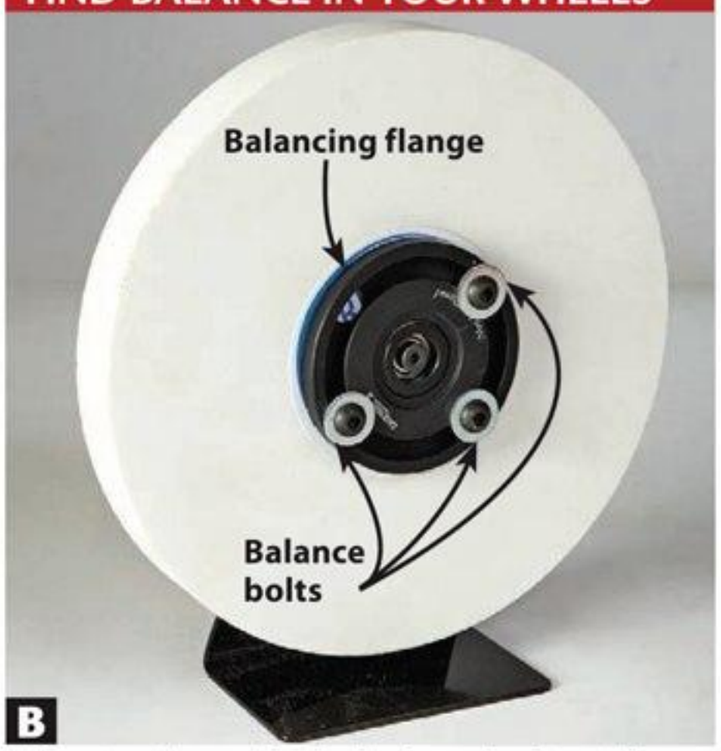
Next, use a dressing tool, such as the diamond-tipped one [**Sources**] shown in **Photo C**, to flatten the wheel edge. The dressing tool also removes metal filings that embed in the wheel's pores as you sharpen. Left embedded, these filings increase heat buildup and reduce sharpening effectiveness.

Give your tools a good rest

The key to creating crisp, sharp cutting edges: Hold tools at a consistent angle, matching the tool edge's bevel angle. If your grinder lacks an adjustable tool rest, make angled wood blocks to replicate the angle, build a tool-holding jig from our plans [see **More Resources**, *right*], or replace the factory-supplied tool rest with an aftermarket model.

Veritas' tool rest [**Photo D**] mounts on your grinder support in front of the wheel. Use it alone or with an optional grinding jig that rides in the shelf slot.

FIND BALANCE IN YOUR WHEELS



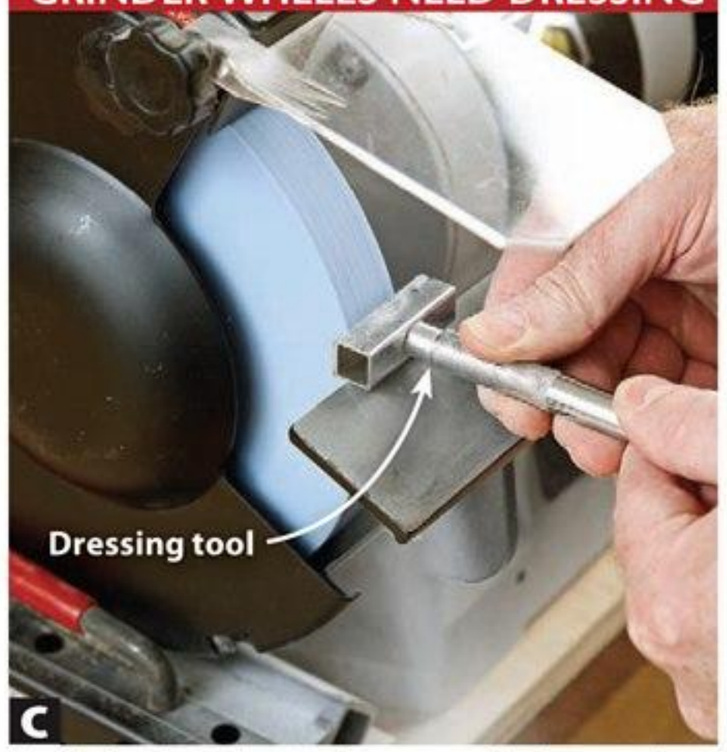
After starting with the balance bolts at the 4-8-12 positions, this wheel needed only slight adjustment to become balanced.

A handy angle gauge comes with the tool rest. Oneway's Wolverine grinding jig [**Photos E & F, Sources**] accepts a variety of rests to easily sharpen chisels, plane irons, or woodturning tools.

Get on solid ground

To keep your bench grinder from scooting away while sharpening, anchor it down. Build a dedicated stand, such as the one on *page 24*, if you have floor space for it. Bolt the grinder to the stand, and if possible, bolt the stand to the floor. If you're squeezed for space, then bolt your grinder to a piece of ¾"-thick plywood, and clamp it to your workbench, as shown *above*.

GRINDER WHEELS NEED DRESSING



Hold the dressing tool perpendicular against the wheel edge for about five seconds to true and clean the sharpening surface.

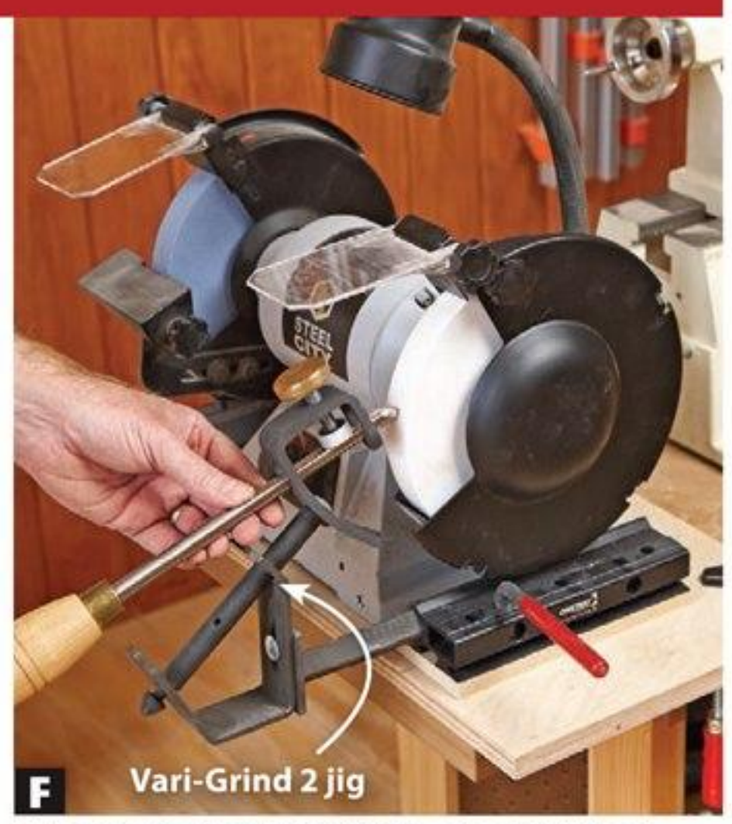
MORE RESOURCES

- To buy project plans for a shop-made grinding jig, go to woodmagazine.com/grindjig.
- To buy project plans for a shop-made grinder stand, go to woodmagazine.com/grindstand.
- Watch a FREE video on sharpening wood chisels on a grinder at woodmagazine.com/sharpenvid.
- Watch FREE videos on sharpening woodturning tools at woodmagazine.com/woodvision. Click on the woodturning link.

UPGRADE TOOL RESTS PROVIDE BETTER TOOL-HOLDING OPTIONS

Veritas' tool rest adjusts at two points, so experiment with it in multiple positions to find the best mounting location.

Use the Wolverine's basic tool rest to sharpen chisels and plane irons. The shelf adjusts 90° for any bevel you'll need.



Replace the basic rest with one designed for woodturning chisels; then quickly and repeatably put a sharp edge on any gouge.

Sources

Aluminum oxide wheels: $25–$35, available at Lee Valley, 800-871-8158, leevalley.com; Rockler Woodworking and Hardware, 800-279-4441, rockler.com; Woodcraft Supply, 800-225-1153, woodcraft.com.

Blade stiffeners: 3½" diameter, #16T01.01, $16.80 per pair; 5" diameter, #16T01.02, $24.50 per pair; Lee Valley.
Wheel balancers: Wolverine Precision Balancing System, #2272 (for ⅝" grinder arbors), $69.95, Oneway Manufacturing, 800-565-7288, oneway.ca.

Dressing tool: #124670, $15, Woodcraft.
Veritas tool rest system: Tool rest, #05M23.01, $49.50; Grinding jig, #05M06.01, $24.50; Lee Valley.
Wolverine grinding jig: #2291 (with two toolrests), $87.95; woodturning accessories sold separately; Oneway Manufacturing.

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Which hand planes should a power-tool woodworker buy first?

Q: I'm strictly a power-tool woodworker, but I've noticed a resurgence in the popularity of hand planes. I don't want to miss out, but where do I start? If you had to recommend three, which hand planes should I start with?

—Robert Risher, Abilene, Texas

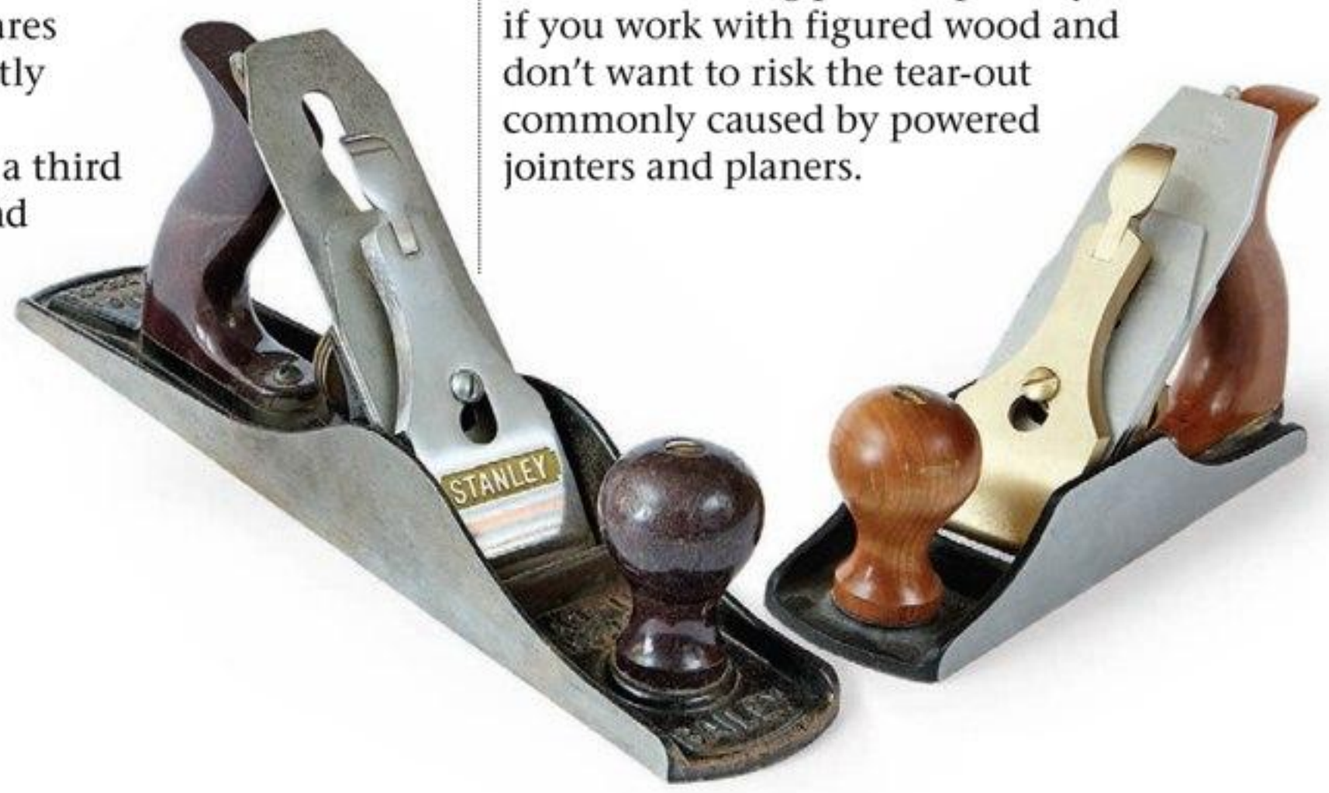
A: An informal poll of the (admittedly power-tool-centric) guys on the *WOOD* staff showed much agreement on the top two contenders, Robert. Your first purchases should be a low-angle block plane and a shoulder plane, *below*. Both help you put a refining touch on the less-than-perfect cuts produced by your power tools.

For example, with a few strokes, a finely tuned low-angle block plane shaves burn marks or fuzz off end grain that saw blades leave behind. The plane quickly evens out jointer scallops on edge grain and even makes short work of shallow chamfers.

With its open sides and body-width blade, a shoulder plane assists you in cleaning up tenons and rabbets and pares corners perfectly square.

In choosing a third must-have hand plane, we agreed to disagree. We can make a good case for the No. 5 jack plane—a good all-around plane. Shorter than a jointer plane and longer than a smoother, the jack plane tackles edge and face flattening well, making it a good introduction to the world of hand-powered stock prep. On the other hand, you may find the shorter-bodied No. 4 smoothing plane especially useful if you work with figured wood and don't want to risk the tear-out commonly caused by powered jointers and planers.

The low-angle block (*left*) and shoulder (*right*) planes make great first planes for the power-tool woodworker, cleaning up marks that motorized tools leave behind.



If you want to replace some powered machining operations with hand-plane work, test the waters with a No. 5 jack plane (*left*) or a No. 4 smoother (*right*).

Stain removal for nooks and crannies

Q: I'm a beginning woodworker using oil stain on a cabinet for the first time. When I wipe off the excess, I'm having a hard time getting it out of interior corners. Any advice?

—Gabriel Garcia, Booneville, Miss.

A: For those pesky corners, Gabriel, a wiping rag might not conform. First, remove as much excess as you can with the rag. Then, use a dry bristle brush on the rest, pulling outward from the corners. Dry the brush as you go by daubing the excess stain on a paper towel. Continue brushing until the stain blends to match the color of the rest of the project.

continued on page 82

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Ask WOOD

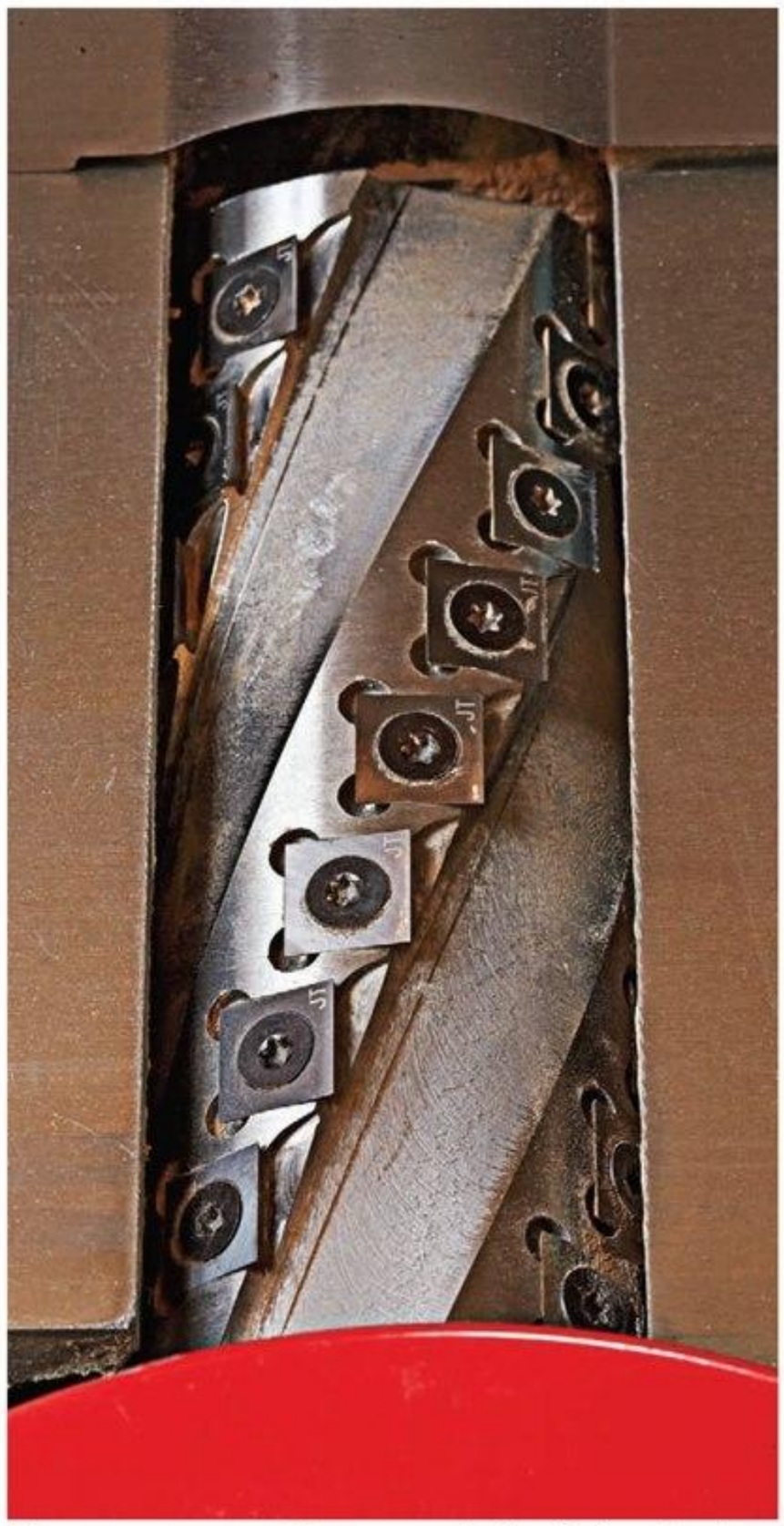
Spiral cutterheads make their mark

Q: I recently bought an aftermarket spiral cutterhead for my jointer. Now when I use it, the face of each board shows slight grooves running along its length. Am I doing something wrong?

—Travis Adair, Cincinnati, Ohio

A: Probably not, Travis. We've found similar results in our tests of spiral cutterheads. The small individual blades that corkscrew around the cutterhead have slightly convex cutting edges that fight tear-out, but also leave the linear striations you're noticing. So if you're used to a nearly finished face out of your straight-knife cutterhead, you might be disappointed by the additional sanding burden added by the spiral cutterhead.

Still, a spiral cutterhead brings several advantages: Where tear-out-prone straight knives can wreak havoc on highly figured woods, spiral heads shear the wood without damage. Also, straight knives can be a hassle to replace and adjust. Not so with spiral cutters. When one edge of the small four-sided, self-indexing cutters becomes dull or nicked, simply rotate them 90° to bring a fresh edge to bear. That adds up to four times the cutting life. And that's not counting the fact that many of the replacement spiral cutterheads use long-lasting carbide rather than high-speed steel. At pennies per replacement cutter, you won't break the bank when you need to replace one, either.



The many square cutters on a spiral cutterhead make adjustments easy but typically leave a slightly less-finished board.

Blue chalk reveals the slight linear peaks—separated by shallow valleys—caused by the convex blades of a spiral cutterhead.

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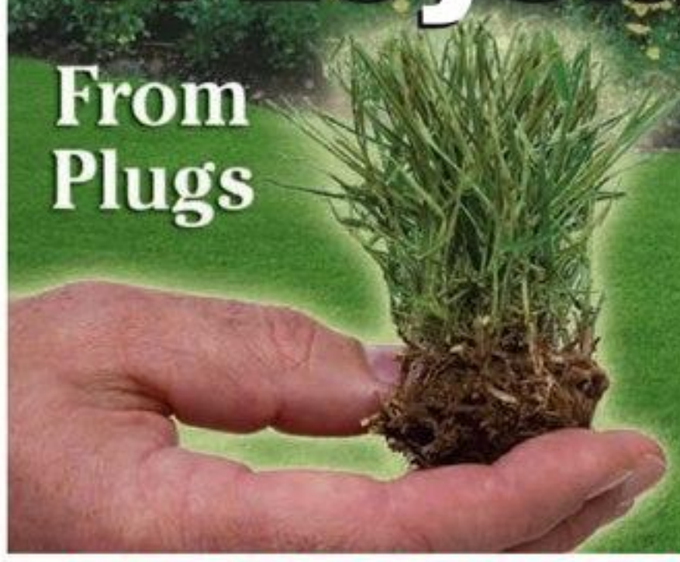

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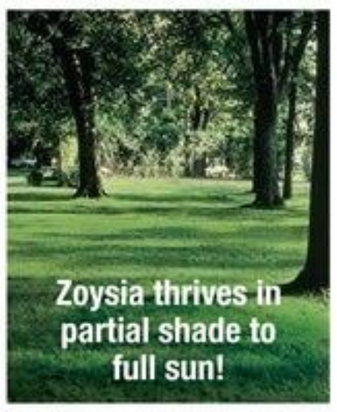

Stop wasting money, time and work sowing new grass seed each spring, only to see birds eat the seed – or rain wash it away – before it can root. Plant a genuine Amazoy™ Zoysia lawn from our living Plugs only once... and never plant a new lawn again!

Zoysia Grows Where Other Grass Doesn't!

Zoysia is the perfect choice for hard-to-cover spots, areas that are play-worn or have partial shade, and for stopping erosion on slopes. North, South, East, West – Zoysia will grow in *any* soil, no ifs, ands or buts!

Each Zoysia Plug You Plant In Your Soil Is
GUARANTEED TO GROW
Within 45 Days Or We'll Replace It FREE!

To ensure best results, we ship you living sheets of genuine Amazoy™ Zoysia Grass, harvested direct from our farms. Plugs are not cut all the way through. Before planting, simply finish the separation by cutting 1"-sq. Plugs with shears or knife. Then follow the included easy instructions to plant Plugs into small plug holes about a foot apart. Our guarantee and planting method are your assurance of lawn success backed by more than 5 decades of specialized lawn experience.

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Eliminates Endless Weeds And Weeding!

No more pulling out weeds by hand or weeds sprouting up all over your lawn. Zoysia Plugs spread into a dense, plush, deep-rooted, established lawn that drives out unwanted growth and stops crabgrass and summer weeds from germinating.

Environmentally Friendly, No Chemicals Needed!

No weeding means no chemicals. You'll never have to spray poisonous pesticides and weed killers again! Zoysia lawns are safer for the environment, as well as for family and pets!

Cuts Watering & Mowing By As Much As 2/3!

Many established Zoysia lawns only need to be mowed once or twice a season. Watering is rarely, if ever, needed – even in summer!

Meyer Zoysia Grass was perfected by the U.S. Gov't, released in cooperation with the U.S. Golf Association as a superior grass.

www.ZoysiaFarms.com/mag

Stays Green In Summer Through Heat & Drought!

When ordinary lawns brown up in summer heat and drought, your Zoysia lawn stays green and beautiful. The hotter it gets, the better it grows. *Zoysia thrives in blistering heat (120°)*, yet it won't winter-kill to 30° below zero. It only goes off its green color after killing frosts, but color returns with consistent spring warmth. Zoysia is the perfect choice for water restrictions and drought areas!

Our Customers Love Their Zoysia Lawns!

One of our typical customers, Mrs. M.R. Mitter of PA, wrote how "I've never watered it, only when I put the Plugs in... Last summer we had it mowed 2 times... When everybody's lawns here are brown from drought, ours just stays as green as ever!"

Order Now And Save!

The more Amazoy™ Zoysia Plugs you order, the more you SAVE! And remember, once your Zoysia lawn is established, you'll have an endless supply of new Plugs for planting wherever you need them. Order now!

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About our product tests

We test hundreds of tools and accessories, but only those that earn at least three stars for performance make the final cut and appear in this section. Prices are current at the time of article production and do not include shipping, where applicable.

SawStop "hybrid" saw proves worthy for home shops

SawStop's 1¾-hp Professional Cabinet Saw brings all the features I like in its heavier-duty tablesaws into a more affordable price range for the home woodworker. This machine, though still a sizable investment at $2,300, features the same cabinet, top, and trunnion-and-arbor assembly as the company's 3-hp Professional Saw, but with a lighter-duty motor and rip fence. And, as with all SawStop tablesaws, this model has flesh-detecting technology that stops the blade before it can cut deeply into your fingers.

The motor runs on 110-volt electrical circuits, a nice option for home shops where 220-volt service might not be available. I ripped 2"-thick red oak to test this saw's mettle, and although it bogged down slightly, it slowed no more than other 110-volt tablesaws. Decreasing the feed rate solved this issue.

I tested the base model for the PCS175 series, which comes with an aluminum T-square-style rip fence and 30" rip capacity. This fence barely moved in my deflection test, and its smooth sidewalls proved straight and square to the tabletop. You can upgrade to a Biesemeyer-like fence in 36" (add $175) or 52" (add $275) rip capacities.

I really like the ease of swapping between the one-piece splitter/blade guard and the shark-fin riving knife: It takes just a quick turn of a lever. And the throat insert features a handle that locks it in place when pushed down.

—Tested by Bob Baker, a three-decade woodworker and former manager of a woodworking store

SawStop 110-volt tablesaw, #PCS175-PFA30

Performance	★★★★★
Price	$2,299

SawStop
866-729-7867; sawstop.com

SuperCharger saves space, energy, and battery life

It's an age-old woodworker's dilemma: Should you store cordless-tool battery packs *off* the charger, where they'll gradually lose their charge; or store them *on* the charger, where "trickle" charging gradually cooks the battery chemistry away and shortens the pack's life? Ryobi solves that problem with the SuperCharger. This portable, multipack station charges any 18-volt Ryobi cordless-tool batteries in an hour or less, and then checks each pack periodically and tops it off when needed.

The SuperCharger proved so efficient that it cost me only a penny a day to keep four packs (a mix of nickel-cadmium and lithium-ion units) charged—the same cost as charging and storing a single pack on the charger that came with my tools. Separate LED indicators for each of the six ports display the current charge condition of each pack.

I mounted the SuperCharger on the wall of my shop using the included mounting bracket, freeing up counter space from a clutter of individual chargers. The device dismounts quickly from the bracket, and has a handle for hauling the whole thing to a worksite.

—Tested by Dave Campbell, Deputy Editor

6-Port battery charger, #P125

Performance	★★★★★
Price	$79

Ryobi
800-525-2579; ryobitools.com

continued on page 86

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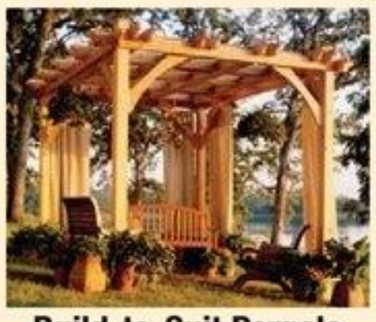

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This driver works it "right" when space is tight

Right-angle drills work great in close quarters, but that cramped space sometimes makes it difficult to apply the needed force to drill a hole or drive a screw. Craftsman's right-angle impact driver doesn't need much operator assistance. Delivering 700 inch-pounds of torque in both forward and reverse, this tool muscled ⅜×4" lag bolts into deck posts while I held it with only one hand. What a time-saver!

This impact driver runs on 12-volt lithium-ion batteries, part of Craftsman's Nextec cordless-tool line. I also like its LED light—especially in tight, dark spaces—because it shines directly where needed. Like all impact drivers, it holds bits with a ¼" quick-connect chuck. And Craftsman also throws in four common driver bits.

—Tested by Bob Hunter, Tools Editor

Right-angle impact driver, #5702

Performance	★★★★★
Price	$100

Craftsman
800-383-4814; craftsman.com

Time travel at the speed of a 1935 Speedster?

The 1930s brought unprecedented innovation in machine-age technology and materials. Industrial designers from the auto industry translated the principles of aerodynamics and streamlining into everyday objects like radios and toasters. It was also a decade when an unequaled variety of watch cases and movements came into being. In lieu of hands to tell time, one such complication, called a jumping mechanism, utilized numerals on a disc viewed through a window. With its striking resemblance to the dashboard gauges and radio dials of the decade, the jump hour watch was indeed "in tune" with the times!

The Stauer *1930s Dashtronic* deftly blends the modern functionality of a 21-jewel automatic movement and 3-ATM water resistance with the distinctive, retro look of a jumping display (not an actual jumping complication). The stainless steel 1 1/2" case is complemented with a black alligator-embossed leather band. The band is 9 1/2" long and will fit a 7–8 1/2" wrist.

True to Machine Art esthetics, the sleek brushed stainless steel case is clear on the back, allowing a peek at the inner workings.

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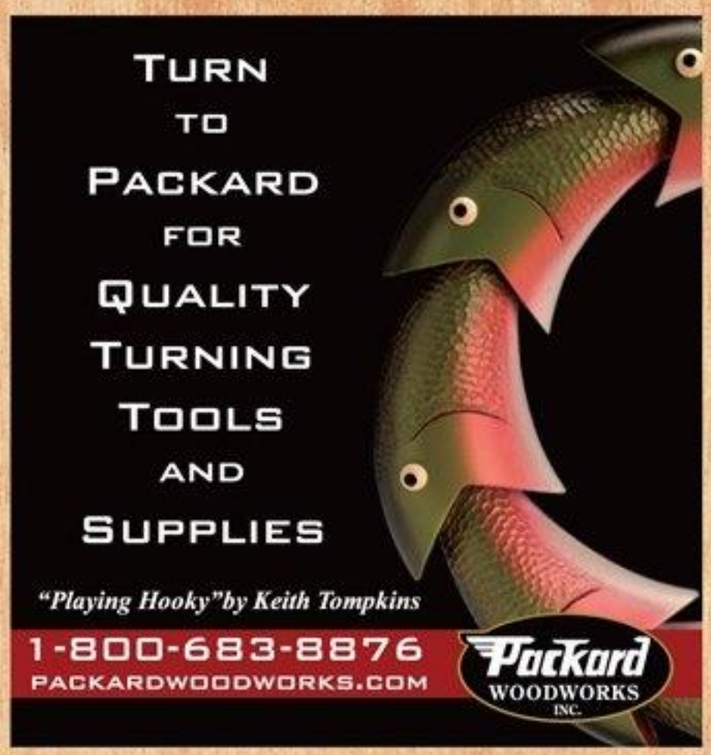

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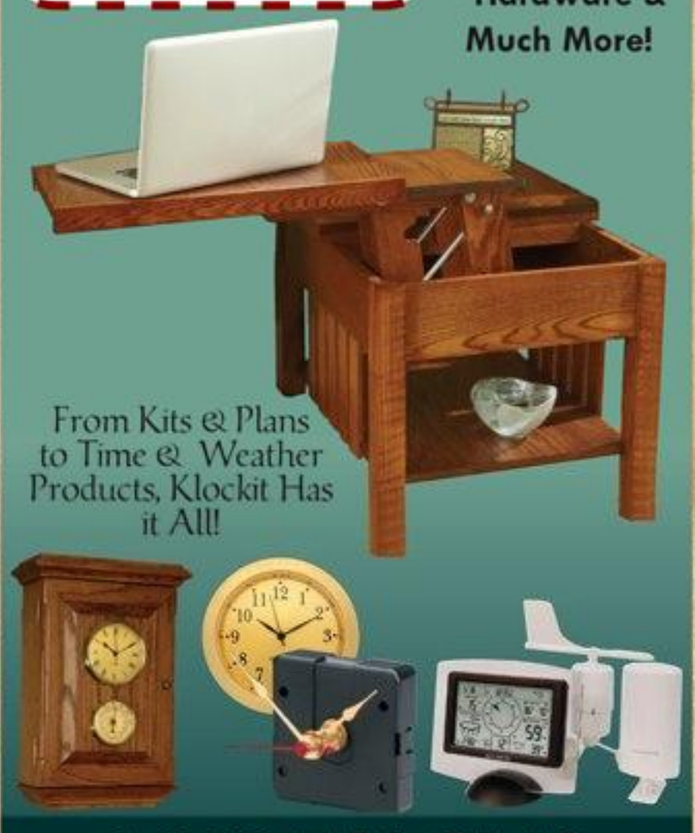

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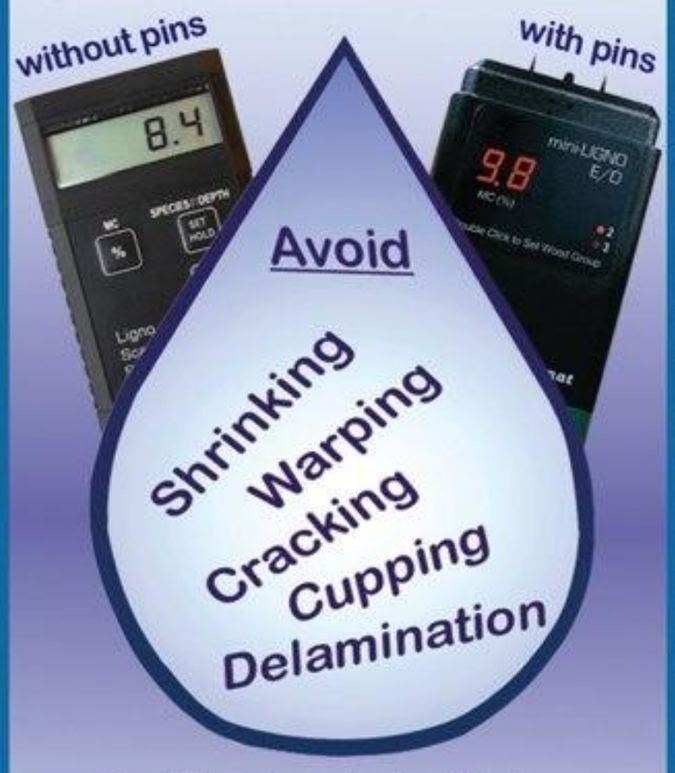

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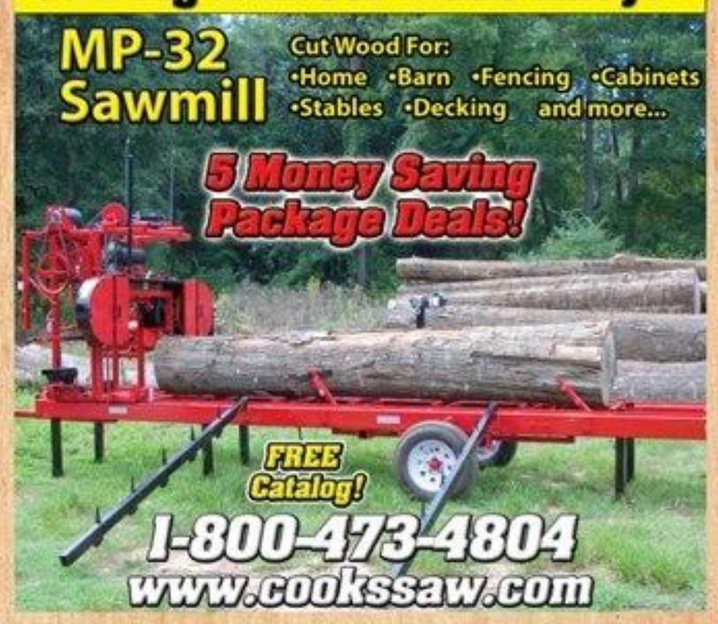

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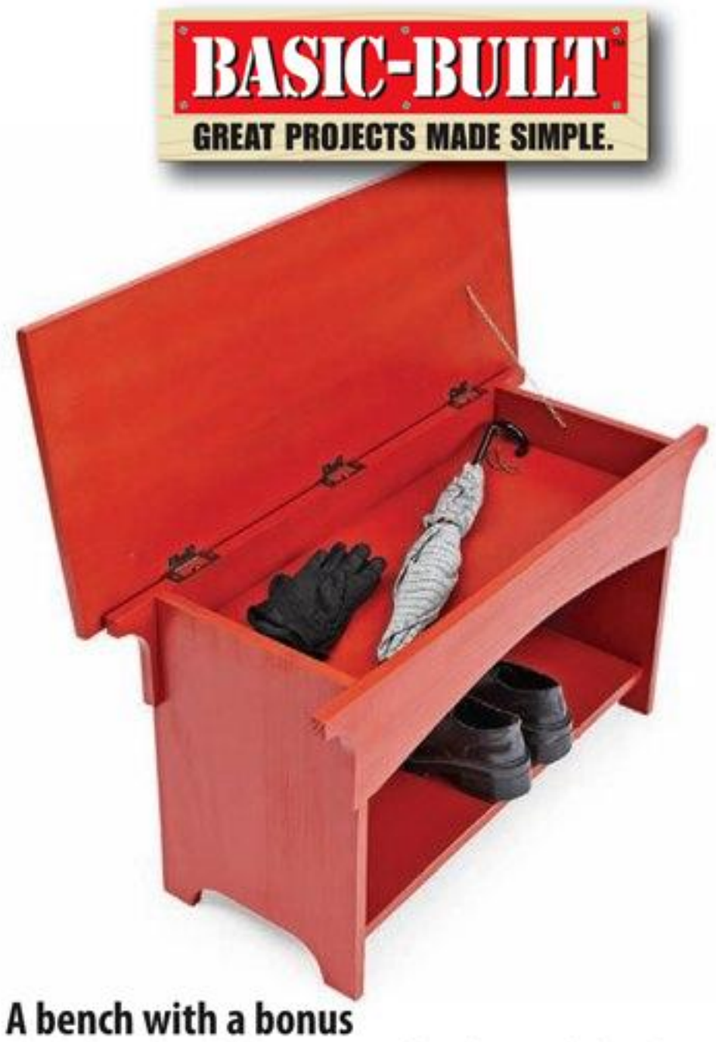
What's Ahead

Coming up in the July 2011 issue (on sale May 10)

Easy glider

Make your own summer breeze with this glider glued and screwed together from home-center cedar. An inexpensive hardware kit makes it swing.



A bench with a bonus

The lid on this Shaker-inspired bench reveals handy hidden storage. Finish it clear or with milk paint.

Biscuit joiners

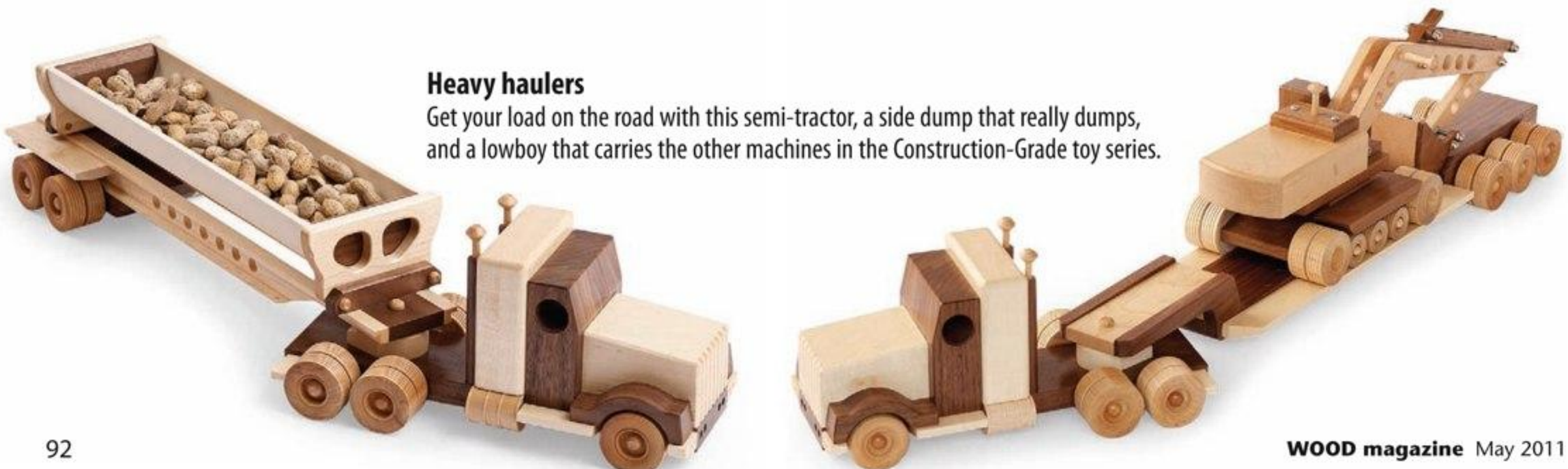
We test six popular models in search of the best among these quick-and-easy joinery tools.

Learn picture-framing fundamentals

A framing pro shows how to showcase artwork with the right combination of mats, molding, and glass.

Bigger isn't always better

Save some scratch (and space) by opting for benchtop versions of some tools. We'll tell you which ones.



Heavy haulers

Get your load on the road with this semi-tractor, a side dump that really dumps, and a lowboy that carries the other machines in the Construction-Grade toy series.

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